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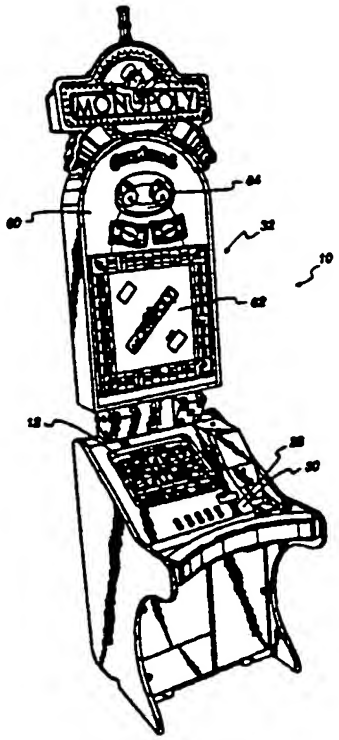
(54) Title: GAMING MACHINE FOR PLAYING A BOARD GAME

(57) Abstract

Gaming machines (10) are disclosed having a basic mode defining a plurality or reels and a bonus mode defining a plurality of stations about a game board (62) (e.g., MONOPOLY board) traversable by a token identifier. The disclosure describes a plurality of play features for the basic and/or bonus modes including (1) a feature allowing the player to select a game token; (2) a feature allowing the player to predict and wager on landing position(s) of the token identifier; (3) a feature allowing the player to obtain deferred-execution instruction(s) which are exercisable by the processor to override later-issued instruction(s) otherwise to be executed by the processor; (4) a feature in which movements of the token identifier are determined according to movement tables corresponding to the various stations of the game board (62); (5) a feature in which escalating bonuses are awarded for reaching a designated bonus square (e.g., the "GO" square); (6) a feature in which bonuses are awarded for completing groups of stations (e.g., color groups); and (7) a feature in which the gaming machine includes two bonus modes, each entered upon certain symbol combinations in the basic game. The first bonus game provides an award selected from a plurality of fixed values and multipliers, and the second bonus game moves a token identifier on a game board (62) and provides an award determined by the landing station of the token identifier.



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GAMING MACHINE FOR PLAYING A BOARD GAME

GAMING MACHINES WITH BOARD GAME THEME

FIELD OF THE INVENTION

The present invention relates generally to gaming machines and, more particularly, to a gaming machine having various play features relating to a board game.

BACKGROUND OF THE INVENTION

Gaming machines, such as slot machines, video poker machines and the like, have been a cornerstone of the gaming industry for several years. Generally, the popularity of such machines with players is dependent on the likelihood (or perceived likelihood) of winning money at the machine and the intrinsic entertainment value of the machine relative to other available gaming options. Where the available gaming options include a number of competing machines and the expectation of winning each machine is roughly the same (or believed to be the same), players are most likely to be attracted to the most entertaining and exciting of the machines. Shrewd operators consequently strive to employ the most entertaining and exciting machines available, because such machines attract frequent play and hence increase profitability to the operator.

One concept which has been successfully employed to enhance the entertainment value of a game is the concept of a "secondary" or "bonus" game which may be played in conjunction with a "basic" game. The bonus game may comprise any type of game, either similar to or completely different from the basic game, which is entered upon the occurrence of a selected event or outcome of the basic game. Generally, bonus games provide a greater expectation of winning than the basic game and may also be accompanied with more attractive or unusual video displays and/or audio. Because the bonus game concept offers tremendous advantages in player appeal and excitement relative to other known games, and because such games are attractive to both players and operators, there is a continuing need to develop gaming machines with new types of bonus games to satisfy the demands of players and operators. The present invention is directed to satisfying this need.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention, there is provided a gaming machine with a feature allowing the player to select a game token. The gaming machine comprises a processor, a selection element and a display. The processor is operable to execute a game program defining a plurality of stations about a game board traversable by a game token. The selection element is operable to select, in response to player input, a game token for illustrating movement between the stations, and the display is operable to display, under control of the processor, the

selected game token at one or more stations on the game board determined by execution of the game program.

In accordance with another aspect of the present invention, there is provided a feature allowing the player to predict and wager on landing position(s) of the token identifier. The gaming machine comprises a processor operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier. The feature comprises selecting, in response to player input, a predicted position of the token identifier to be determined by execution of the game program, the predicted position corresponding to one of the stations on the game board. Then, the game program is executed under processor control to determine a true position of the token identifier. The processor compares the predicted position of the token identifier to the true position of the token identifier, and a payoff is awarded to the player if the predicted position corresponds to the true position. In one embodiment, a bonus payoff is made if the predicted position was reached in response to a target movement value.

In accordance with still another aspect of the present invention, there is provided a gaming machine with a feature allowing the player to obtain deferred-execution instruction(s) which are exercisable by the processor to override later-issued instruction(s) otherwise to be executed by the processor. The gaming machine includes a processor operable in a basic mode and a bonus mode, respectively, to select basic game and bonus game outcomes. A display is provided for displaying indicia of the selected outcomes. The processor issues game control instructions associated with the respective indicia. The game control instructions include nominal executable instructions adapted for execution by the processor upon display of the respective indicia and at least one deferred executable instruction adapted for deferred execution by the processor. The deferred execution instruction might occur in the basic game and be exercised in the bonus game. In one embodiment, the game control instructions include an end-bonus instruction (e.g., GO TO JAIL) which nominally cause the processor to end the bonus game, and the deferred executions include an override command (e.g., GET OUT OF JAIL, FREE) executable to override the end-bonus instruction.

In accordance with yet another aspect of the present invention, there is provided a feature in which movements of the token identifier are determined according to movement tables corresponding to the various stations of the game board. The gaming machine includes a processor and a game memory. The processor is operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier. Movements of the token identifier about the game board are determined according to movement tables stored in the game memory. Each of the movement tables correspond to one of the stations of the game board and define a set of possible movement outcomes from that station. After identifying the position (station) of the token

identifier on the game board, the processor consults the movement table corresponding to that position to select a movement outcome. Then, the processor moves the token a number of steps on the game board corresponding to the selected movement utcome.

In accordance with still yet another aspect of the present invention, there is provided a feature in which escalating bonuses are awarded for reaching a designated bonus square on the game board. The gaming machine includes a processor operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, one of the stations being designated as a bonus station. As the token identifier is advanced along the game board, payoff(s) are made to the player when the token identifier reaches the bonus station, the payoffs escalating in value each successive time the token identifier reaches the bonus station.

In accordance with a still further aspect of the present invention, there is provided a feature in which bonuses are awarded for completing groups of stations (e.g., color groups) on the game board. The gaming machine includes a processor operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the plurality of stations having at least one discernible subset defining a station group (e.g., a color group). As the token identifier is advanced along the game board, the processor identifies respective landing stations occupied by the token identifier. If the landing station is a member of a station group, the processor designates the landing station as a "completed" station. Then, the processor evaluates the station status of the other stations in the group. If each of the other stations in the group are also completed, the processor designates the group as a completed group and provides a reward to the player, which might comprise an extra "spin" or play of the game, or might increase the award otherwise associated with the station.

In accordance with a still yet further aspect of the present invention, there is provided a gaming machine with a processor operable in a basic mode and two bonus modes. In the basic mode, the processor is operable to display a basic game outcome defining a symbol group. If the symbol group includes a first bonus combination, the processor enters the first bonus mode and, if the symbol group includes a second bonus combination, the processor enters the second bonus mode. In the first bonus mode, the processor sets up the first bonus game by defining a plurality of first bonus selection elements including fixed values and multipliers. Then, the processor operates to select one of the selection elements and the player is awarded a credit based on the value of the selected selection element. In the second bonus mode, the processor operates to define a plurality of stations about a game board traversable by a token identifier. Then, the processor executes a movement of the token identifier to determine a landing station, and the player is awarded a credit based on the value of the landing station.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

FIG. 1 is a perspective view of a video gaming machine with a board game theme according to one embodiment of the present invention;

FIG. 2 is a block diagram of the gaming machine of FIG. 1;

FIG. 3 shows the top box glass of the gaming machine of FIG. 1;

FIG. 4 is an illustration of a five-reel, nine-line video gaming machine basic game which may be implemented on the gaming machine of FIG. 1;

FIG. 5 is an illustration of a "Pick Token" screen which appears on the video display of the gaming machine of FIG. 1 according to one embodiment of the present invention;

FIG. 6 is an illustration of a bonus round play screen which may appear on the video display of the gaming machine of FIG. 1 according to one embodiment of the present invention;

FIG. 7 is an illustration of a "Build Houses" screen which appears on the video display of the gaming machine of FIG. 1 according to one embodiment of the present invention;

FIG. 8 is a perspective view of a video gaming machine with a board game theme according to another embodiment of the present invention;

FIG. 9 is a block diagram of the gaming machine of FIG. 8;

FIG. 10 shows the top box glass of the gaming machine of FIG. 8;

FIG. 11 is an illustration of a five-reel, five-line video gaming machine basic game which may be implemented on the gaming machine of FIG. 8;

FIG. 12 is an illustration of a "Pick Token" screen which appears on the video display of the gaming machine of FIG. 8 according to one embodiment of the present invention;

FIG. 13 is an illustration of a bonus round play screen which may appear on the video display of the gaming machine of FIG. 1 according to one embodiment of the present invention;

FIG. 14 is a perspective view of a spinning reel gaming machine with board game theme according to yet another embodiment of the present invention;

FIG. 15 is a block diagram of the gaming machine of FIG. 14;

FIG. 16a shows a portion of the top box glass of the gaming machine of FIG. 14;

FIG. 16b shows a game board portion of the gaming machine of FIG. 14;

FIG. 17 is an illustration of three reel strips associated with a basic game which may be implemented on the gaming machine of FIG. 14;

FIG. 18 is an illustration of a CHANCE bonus screen which may appear on the dot matrix display of the gaming machine f FIG. 14;

FIG. 19 is an illustration of a WATER WORKS screen which may appear on the dot matrix display of the gaming machine of FIG. 14;

FIG. 20 is an illustration of an ELECTRIC COMPANY screen which may appear on the dot matrix display of the gaming machine of FIG. 14;

FIG. 21 is an illustration of a FREE PARKING screen which may appear on the dot matrix display of the gaming machine of FIG. 14;

FIG. 22 is a perspective view of a spinning reel gaming machine with board game theme according to yet another embodiment of the present invention;

FIG. 23 is a block diagram of the gaming machine of FIG. 22; and

FIG. 24 shows a portion of the top box glass of the gaming machine of FIG. 22;

FIG. 25 is an illustration of three reel strips associated with a basic game which may be implemented on the gaming machine of FIG. 22.

FIG. 26 shows a first part of a flowchart showing the operation of a specific example of one embodiment.

FIG. 27 shows in detail the bonus game operation of the flowchart of FIG. 26.

While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. However, it should be understood that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DESCRIPTION OF SPECIFIC EMBODIMENTS

Turning now to the drawings and referring initially to FIG. 1, there is depicted a gaming machine 10 with a board game theme. In one embodiment, the gaming machine 10 is operable to play a game entitled MONOPOLY ONCE AROUND™, based on the popular MONOPOLY™ board game. MONOPOLY™ is a registered trademark owned by and used with permission by Hasbro, Inc. and Hasbro International, Inc., Pawtucket, Rhode Island. Nevertheless, it will be appreciated that the gaming machine 10 may be implemented with any of several other board game themes other than MONOPOLY™.

The gaming machine 10 includes a video display 12 and a top box display 32. The video display 12 may comprise a dot matrix, CRT, LED, LCD, electro-luminescent display or generally any type of video display known in the art. The top box display 32 has a facing surface 60 comprising a partially translucent material such as glass, plastic, Plexiglas or the like which

includes an adaptation of a game board 62 (e.g., MONOPOLY) displayed thereon. The game board 62 is backlit by a number of lights 66 (not visible in FIG. 1) in the top box display 32. A pair f mechanical dice 64 are displayed near the top of the top box display 32.

FIG. 2 is a block diagram of a c ntrol system suitable for operating the slot machine 10. Coin/credit detector 82 signals a CPU 70 when a player has inserted a number of coins or played a number of credits. Then, after the player has activated a switch 84 (e.g., by pulling a lever or pushing a button), the CPU 70 operates to display reels 14, 16, 18, 20 and 22 on the video screen 12. Then, the player activates one or more selected paylines 72-80 and presses the "Spin Reels" button 36 or "Max Bet Spin" button 37 to "spin" the reels, as will be described in greater detail in relation to FIG. 4. The CPU 70 randomly selects a game outcome and causes the video display 12 to display indicia (e.g., symbols on reels 14, 16, 18, 20 and 22) corresponding to the pre-selected game outcome. In one embodiment, the symbols displayed on the reels define the basic game outcome.

A system memory 86 stores control software, operational instructions and data associated with the gaming machine 10. In one embodiment, the memory 86 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the memory 86 may be implemented on any of several alternative types of memory structures or may be implemented on a single memory structure. A payoff mechanism 88 is operable in response to instructions from the CPU 70 to award a payoff of coins or credits to the player in response to certain winning combinations stored in memory 86. As will be described in detail hereinafter, the payoff amounts corresponding to certain combinations is predetermined according to a pay table stored in system memory 86. A separate I/O controller 71 coupled to the CPU 70 operates the mechanical dice 64 and top box lights 66.

The gaming machine 10 is operable to play a "basic" game and a secondary or "bonus" game. The basic game is implemented on the video display 12 on five video simulated spinning reels, 14, 16, 18, 20 and 22 (hereinafter "reels") with nine paylines 72-80, as best observed in FIG. 4. Generally, game play is initiated by inserting a number of coins or playing a number of credits, causing the CPU 70 (FIG. 2) to activate a number of paylines corresponding to the number of coins or credits played. After activation of the paylines, the reels 14, 16, 18, 20 and 22 are set in motion by either pulling a lever (not shown), pressing a push button, or touching a touch screen "key" on the video display 12.

In the embodiment of FIG. 4, each of the paylines 72-80 extend through one symbol on each of the five reels 14, 16, 18, 20 and 22. Payline 72 starts at the upper left symbol (e.g., "DOG") on reel 14, extends through the center symbol (e.g., "DICE") on reel 16, the lower

symbol (e.g., "CHANCE") n reel 18, the center symbol (e.g., "DICE") n reel 20 and terminates at the top symbol (e.g., "ELECTRIC CO.," hereinafter "LIGHT") n reel 22. Payline 73 starts at the upper left symbol (e.g., "DOG") on reel 14, extends thr ugh the center symbol (e.g., "DICE") n reel 16, the upper symbol (e.g., "SHOE") on reel 18, the center symbol (e.g., "DICE") on reel 20 and terminates at the top symbol (e.g., "LIGHT") on reel 22. Payline 74 extends through the top symbol on each reel (e.g., "DOG" on reel 14, "COMMUNITY CHEST," hereinafter "CHEST" on reel 16, "SHOE" on reel 18, "CAR" on reel 20 and "LIGHT" on reel 22.) Payline 75 starts at the center symbol (e.g., "FREE PARKING," hereinafter "PARK") on reel 14, extends through the lower symbol (e.g., "SHOE") on reel 16, the center symbol (e.g., "RING") on reel 18, the lower symbol (e.g., "RICH UNCLE PENNYBAGS," hereinafter "PENNY") on reel 20 and terminates at the center symbol (e.g., "DOG") on reel 22. Payline 76 extends through the center symbol on each reel (e.g., "PARK" on reel 14, "DICE" on reel 16, "RING" on reel 18, "DICE" on reel 20 and "DOG" on reel 22.) Payline 77 starts at the center symbol (e.g., "PARK") on reel 14, extends through the upper symbol (e.g., "CHEST") on reel 16, the center symbol (e.g., "RING") on reel 18, the upper symbol (e.g., "CAR") on reel 20 and terminates at the center symbol (e.g., "DOG") on reel 22. Payline 78 extends through the lower symbol on each reel (e.g., "TRAIN" on reel 14, "SHOE" on reel 16, "CHANCE" on reel 18, "PENNY" on reel 20 and "DICE" on reel 22.) Payline 79 starts at the lower symbol (e.g., "TRAIN") on reel 14, extends through the center symbol (e.g., "DICE") on reel 16, the lower symbol (e.g., "CHANCE") on reel 18, the center symbol (e.g., "DICE") on reel 20 and terminates at the lower symbol (e.g., "DICE") on reel 22. Payline 80 starts at the lower symbol (e.g., "TRAIN") on reel 14, extends through the center symbol (e.g., "DICE") on reel 16, the upper symbol (e.g., "SHOE") on reel 18, the center symbol (e.g., "DICE") on reel 20 and terminates at the lower symbol (e.g., "DICE") on reel 22.

In one embodiment, the player selects the number of paylines (between one and nine) to play by pressing one of the five buttons in the top row 28 or by using the "Select Lines" key 34 on the video display 12. The player then chooses one of the five buttons in the bottom row 30 that correspond to the number of coins or credits to bet on each of the nine paylines. Selecting one of the buttons in the bottom row 30 sets the five video reels, 14, 16, 18, 20 and 22 in "motion". As an alternative, the player may touch the "Bet Per Line" key 35 on the video display 12 until the desired bet is displayed and then touch the "Spin Reels" key 36 on the video display 12 to begin the game. As another alternative, if the player wishes to bet the maximum amount of lines and the maximum bet per line, the player may touch the "Max Bet Spin" key 37 on the video display 12 to begin the game. In one embodiment, the game can be set for a maximum bet of 5 or 10 credits on

each payline for a maximum total bet of 45 or 90 credits per game. The CPU 70 assigns an equal amount of credits bet for each payline and then spins all five reels 14, 16, 18, 20 and 22.

The CPU 70 uses a random number generator (not shown) to select a game outcome (e.g., "basic" game outcome) corresponding to a particular set of reel "stop positions". The CPU 70 then causes each of the video reels 14, 16, 18, 20 and 22 to stop at a preselected stop position. Video symbols (see FIG. 4) are displayed on the reels 14, 16, 18, 20 and 22 to graphically illustrate the reel stop position and indicate whether the stop position of the reels represents a winning game outcome. Winning "basic" game outcomes (e.g., symbol combinations resulting in payment of coins or credits) are identifiable by a pay table (see Table A-1). In one embodiment, the pay table is affixed to the machine 10 and/or displayed by the video display 12 in response to a command by the player (e.g., by pressing the "PAY TABLE" button 45).. The pay table enables the player to view the winning combinations and their associated payoff amounts. If the displayed symbols stop in a winning combination, the game awards the player the award corresponding to the award in the pay table for that combination multiplied by the amount of credits bet on the winning payline.

TABLE A-1
MONOPOLY - ONCE AROUND
BASIC GAME

												MaxBet	9/18/45/90	
TYPE	9 LINE	5 REEL												
	WIN COMBINATIONS				R # 1	R # 2	R # 3	R # 4	R # 5	# OF HITS	PAY	TOTAL	PROB	EV
PENNYBAGS					1	2	2	2	4					
penny	penny	penny	penny	penny	1	2	2	2	4	32	20000	640000	0.000000	0.25%
penny	penny	penny	penny		1	2	2	2	44	352	1000	352000	0.000001	0.14%
penny	penny	penny			1	2	2	46	48	8352	200	1710400	0.000034	0.67%
penny	penny				1	2	40	48	48	178080	20	3561600	0.000699	1.40%
DICE														
dice	dice	dice	dice	dice	4	4	7	6	7	4704	250	1176000	0.000018	0.46%
dice	dice	dice	dice		4	4	7	6	41	27552	50	1377600	0.000108	0.54%
dice	dice	dice			4	4	7	42	48	225792	10	2257920	0.000886	0.89%
dice	dice				4	4	41	48	48	1511424	5	7557120	0.005932	2.97%
CAR					4	4	4	4	6					
car	car	car	car	car	4	4	4	4	6	1536	600	921600	0.000006	0.36%
car	car	car	car		4	4	4	4	42	10752	125	1344000	0.000042	0.53%
car	car	car			4	4	4	44	48	125952	50	6297600	0.000494	2.47%
car	car				4	4	36	48	48	1327104	5	6635520	0.005208	2.60%
DOG					4	4	4	4	6					
dog	dog	dog	dog	dog	4	4	4	4	6	1536	500	768000	0.000006	0.30%
dog	dog	dog	dog		4	4	4	4	42	10752	100	1075200	0.000042	0.42%
dog	dog	dog			4	4	4	44	48	125952	30	3778560	0.000494	1.48%
dog	dog				4	4	36	48	48	1327104	3	3981312	0.005208	1.56%
SHOE					4	4	4	4	6					
shoe	shoe	shoe	shoe	shoe	4	4	4	4	6	1536	500	768000	0.000006	0.30%
shoe	shoe	shoe	shoe		4	4	4	4	42	10752	100	1075200	0.000042	0.42%
shoe	shoe	shoe			4	4	4	44	48	125952	30	3778560	0.000494	1.48%
shoe	shoe				4	4	36	48	48	1327104	3	3981312	0.005208	1.56%
ANY TOKEN														
anyt	anyt	anyt	anyt	anyt	12	12	12	12	18	359424	50	17971200	0.001411	7.05%
anyt	anyt	anyt	anyt		12	12	12	12	30	552960	20	11059200	0.002170	4.34%
anyt	anyt	anyt			12	12	12	36	48	2654208	5	3981312	0.010417	5.21%
RING					6	4	6	4	1					
ring	ring	ring	ring	ring	7	6	8	6	5	10040	300	3012000	0.000039	1.18%

ring	ring	ring	ring		7	6	8	6	43	85656	70	5995920	0.000336	2.35%
ring	ring	ring			7	6	8	42	48	669312	20	13386240	0.002627	5.25%
TRAIN					6	6	5	5	2					
train	train	train	train	train	7	8	7	7	6	16416	250	4104000	0.000064	1.61%
train	train	train	train		7	8	7	7	42	114072	60	6844320	0.000448	2.69%
train	train	train			7	8	7	41	48	743904	15	11158560	0.002920	4.38%
FREE PARKING					7	8	5	4	1					
park	park	park	park	park	8	10	7	6	5	16760	200	3352000	0.000066	1.32%
park	park	park	park		8	10	7	6	43	143448	50	7172400	0.000563	2.81%
park	park	park			8	10	7	42	48	1100736	10	11007360	0.004015	4.32%
ELECTRIC CO.					8	8	9	11	11					
light	light	light	light	light	8	8	9	11	11	69696	100	6969600	0.000274	2.74%
light	light	light	light		8	8	9	11	37	234432	40	9377280	0.000920	3.68%
light	light	light			8	8	9	37	48	1022976	7	7160832	0.004015	2.81%
														73.05%
SCATTERED PAYS														
COMMUNITY CHEST					2	2	1	2	2					
chest	chest	chest	chest	chest	6	6	3	6	6	3888	200	777600	0.000015	0.03%
chest	chest	chest	chest		6	6	3	6	42	27216	20	544320	0.000107	0.02%
	chest	chest	chest	chest	42	6	3	6	6	27216	20	544320	0.000107	0.02%
		chest	chest	chest	48	42	3	6	6	217728	7	1524096	0.000854	0.07%
	chest	chest	chest		42	6	3	6	42	190512	7	1333584	0.000748	0.06%
chest	chest	chest			6	6	3	42	48	217728	7	1524096	0.000854	0.07%
CHANCE					2	2	1	2	2					
chance	chance	chance	chance	chance	6	6	3	6	6	3888	200	777600	0.000015	0.03%
chance	chance	chance	chance		6	6	3	6	42	27216	20	544320	0.000107	0.02%
	chance	chance	chance	chance	42	6	3	6	6	27216	20	544320	0.000107	0.02%
		chance	chance	chance	48	42	3	6	6	217728	7	1524096	0.000854	0.07%
	chance	chance	chance		42	6	3	6	42	190512	7	1333584	0.000748	0.06%
chance	chance	chance			6	6	3	42	48	217728	7	1524096	0.000854	0.07%
														0.34%
				TOTAL	48	48	48	48	48	1551913 6		19863908 8		73.69%

Table A-1 is a pay table identifying various winning combinations of symbols in the MONOPOLY ONCE AROUND™ basic game and their mathematical probabilities and expected values. The various symbols used in the MONOPOLY ONCE AROUND™ basic game include: "RICH UNCLE PENNYBAGS" ("PENNY"), "DICE," "CAR," "DOG," "SHOE," "RING," "TRAIN," "PARK," "LIGHT," "CHEST" and "CHANCE." The "WIN COMBINATIONS" column identifies the various win combinations which may occur by symbols stopping on an active payline. Generally, winning combinations require that at least two of five corresponding symbols be displayed, left to right, starting on reel 14 (designated "R #1" in Table A-1) on an active payline. For example, two "PENNY" symbols displayed on adjacent reels 14 ("R #1") and 16 would be a winning combination. The "ANY TOKEN" combination is satisfied by any combination of three or more "CAR," "DOG" and "SHOE" symbols stopping on an active payline, left to right, starting on reel 14 ("R #1"). For example, a "DOG" symbol on reel 14 ("R #1"), followed by a "SHOE" symbol on reel 16 ("R #2") and another "DOG" symbol on reel 18 ("R #3") would be a winning "ANY TOKEN" combination.

In one embodiment, the "PENNY" symbol acts as a wildcard for the "RING," "TRAIN," and "PARK" symbol combinations. Thus, for example, the combination of "RING," "PENNY" and "RING" on adjacent reels 14 ("R #1"), 16 ("R #2") and 18 ("R #3") is a winning combination.

The "SCATTERED PAYS" column identifies the various win combinati ns which may occur by symbols which are not necessarily aligned with an active payline. A winning combination of the scatter-pay type occurs when scatter-pay symbols are displayed, in any position, on the appropriate reels. In the MONOPOLY ONCE AROUND™ basic game, the "CHEST" and "CHANCE" symbols are scatter-pay symbols and winning combinations occur when three or more of these symbols are displayed on consecutive and adjacent interchangeable reels. For example, three "CHEST" symbols displayed on adjacent reels 16 ("R #2"), 18 ("R #3") and 20 ("R #4"), is a winning scatter-pay combination in the MONOPOLY ONCE AROUND™ game.

The "# OF HITS" column of Table A-1 identifies, for each winning combination, the product of the number of symbols on each reel supporting the combination. For example, consider the combination of five "PENNY" symbols. This combination is the highest value combination in the MONOPOLY ONCE AROUND™ basic game because there are relatively few "PENNY" symbols on each reel and, consequently, the probability of hitting a "PENNY" symbol on each reel is very low. Specifically, in the embodiment of Table A-1, there is one "PENNY" symbol on reel 14 ("R #1"), two "PENNY" symbols on reel 16 ("R #2"), two "PENNY" symbols on reel 18 ("R #3"), two "PENNY" symbols on reel 20 ("R #4") and four "PENNY" symbols on reel 22 ("R #5"). Thus, the "# OF HITS" for the combination of five consecutive "PENNY" symbols is 32 (i.e., 1 x 2 x 2 x 2 x 4).

The "PAY" column of Table A-1 identifies the amount of coin(s) or credit(s) awarded for the various winning combinations in the basic game, per unit wagered. Thus, for example, the "PENNY," "PENNY" combination appearing on reels 14, 16 ("R #1, R #2") will pay 20 coins or credits with one coin played; that same combination will pay 100 coins or credits with five coins played.

The "TOTAL" column of Table A-1 lists, for each winning combination, the product of the "# OF HITS" value and the "PAY" value. The five "PENNY" combination, for example, having 32 hits each paying 20,000 coins or credits, has a "TOTAL" value of 640,000.

In one embodiment, each of the reels 14, 16, 18, 20 and 22 have 48 symbol positions, thus the odds of hitting each unique combination relative to a single active payline is one in about 254 million (i.e., $1 \div (48)^5$). The "PROB" column identifies the probability of hitting the various winning combinations in a single spin. For example, there are only 32 symbol combinations out

of about 250 million symbol combinations that will result in the combinati n of five consecutive "PENNY" symbols. Thus, the probability of hitting that combinati n is 32 ÷ 254 million r about 1.25×10^{-7}.

The "EV" column of Table A-1 identifies the expected value of the vari us winning combinations, which is computed as the product of the "PAY" and "PROB" values. Thus, for the five "PENNY" combination, the expected value is 0.0025 ($20{,}000 \times 1.25 \times 10^{-7}$). The payout rate of the basic game, identified at the bottom of the "EV" column, is computed by summing each of the expected values. In the embodiment of Table A-1, the payout rate of the basic game is 73.60%

The Bonus Game

The bonus game is triggered when a special "start-bonus" outcome occurs in the basic game. In the MONOPOLY ONCE AROUND™ game, a winning combination of three or more "DICE" symbols in the basic game represents a "start-bonus" outcome which causes the CPU 70 to execute a game control instruction which enters the bonus game. In one embodiment, the bonus game has a board-game (e.g., MONOPOLY) theme and is implemented on the top box game board 62 and video display 12. The board game defines a plurality of stations or squares about a game board traversable by a game token, or token "identifier" indicating the *position* of a token, or player. For example, a token "identifier" comprises in one embodiment an illuminated station of the top box game board 62 indicating the position of a token, or player otherwise not displayed on the top box game board 62. Hereinafter, references to displaying the position of a token, or player, shall be understood to mean the display of either an actual game token or a token identifier on a game board or portion thereof.

Upon initially entering the bonus game, the CPU 70 operates to replace the display of reels 14, 16, 18, 20, 22 on video display 12 with a token selection screen (FIG. 5) offering a selection of board game tokens 40. In the MONOPOLY ONCE AROUND™ game, the token selection screen displays an animated Rich Uncle Pennybags symbol 38 above a selection of MONOPOLY tokens 40 (e.g., "CAR," "DOG," "HORSE," "SHOE" and "HAT"), and the player is prompted to select one of the game tokens 40. In one embodiment, the video display 12 comprises a touch-screen display and the selection of a game token 40 is accomplished by touching the desired token on the display 12. It will be appreciated, however, that any of several known player control devices may be used to implement the selection of a token 40. In another embodiment, the player scrolls through the tokens 40 and selects a particular token by depressing a designated "select" button on the gaming machine 10 when the desired token 40 is highlighted. Scrolling through the tokens 40 prior

to the selecti n f the desired token may also be acc mplished automatically according to the game program or may b controlled by the player pressing various buttons. Once the player selects a token 40, the CPU 70 operates t display a portion f the game board on the video display 12 with the selected token on a starting station of the game board. The CPU 70 also signals I/O controller 71 to illuminate the starting station on the top box game board 62. For example, in the MONOPOLY ONCE AROUND™ game, the starting station is the 'GO' square. The CPU 70 operates to display the selected MONOPOLY token on the GO square of a scrolling video MONOPOLY board on the video display 12, and also signals I/O controller 71 to illuminate the GO square on the top box MONOPOLY board 62.

Next, in one embodiment, the CPU 70 selects an integer movement value defining a number of stations or steps which the token is to be moved from the GO square. In one embodiment, the integer movement value is selected from a plurality of movement values corresponding to the sum of two dice. In this case, the selection of the movement value might comprise selecting two integer values, each corresponding to a possible outcome of one of the dies, then summing the integer values. For example, in one embodiment, the CPU 70 selects a first integer value, from one to six, corresponding to the faces of a six-sided first die, then selects a second integer value, from one to six, corresponding to the faces of a six-sided second die. The CPU 70 sums the two values to define the integer movement value, comprising a number from two to twelve. Alternatively, the CPU 70 might select an integer movement value from two to twelve without selecting and summing intermediate values.

In one embodiment, the player "rolls" a pair of dice by touching a "Roll Dice" key 41 or "Auto Roll" key 42 on the video display 12. The outcome of each roll (e.g., the integer movement value) is selected by the CPU 70 which then issues game control instructions to display indicia of the pre-determined "roll." In one embodiment, the displayed indicia comprise mechanical dice 64 and a pair of "video" dice 43 on the video display 12 (FIG. 6). In one embodiment, the mechanical dice 64 are driven by I/O controller 71, in response to game control instructions from the CPU 70, to mechanically rotate and then stop to reveal the predetermined outcome of the roll. The video dice 43 similarly "rotate" and then stop to reveal the predetermined roll in response to instructions from the CPU 70. The outcome of the roll of dice 43 (FIG. 6) and 64 (FIG. 1) determines how many spaces the token will be moved from its previous position on the game board. On the top box display 32, movement is illustrated by the illumination, in step-wise fashion, of the appropriate stations (squares) on the game board 62 (e.g., MONOPOLY board) from the previous position to the position determined by the roll of dice. On the video display 12,

movement is illustrated by the selected game token 40 (e.g., "SHOE" in FIG. 6) moving, ne space at a time, a corresponding number f spaces on a scrolling portion of the game board.

In one embodiment, when the token 40 stops moving for each roll, an animated character icon (e.g., Rich Uncle Pennybags, in the MONOPOLY ONCE AROUND™ game) announces the name of the station (square) landed on by the token 40. The player is awarded the amount indicated on the station multiplied by the line bet. In one embodiment, the player might be awarded an additional amount resulting from a side bet, if any, associated with the station (which will be described in relation to FIG. 7). In one embodiment, the bonus game continues with consecutive rolls of the dice, with the player collecting various amounts corresponding to the landing stations determined by the rolls of dice, until the player's token has completed one trip around the game board. If the rolls are initiated by pressing the "Roll Dice" key 41, the game will pause between rolls until the player touches the key 41 or 42. If the rolls are initiated by the "Auto Roll" key 42, the CPU 70 causes the dice to roll automatically after a small delay following the previous roll.

In the MONOPOLY ONCE AROUND™ game, if the game token 40 lands on a "Chance" or "Community Chest" station (square) during the bonus round, the CPU 70 triggers an animation on video display 12 which shows the top card of a pile of cards flipping up to reveal the "Chance" or "Community Chest" outcomes. The art on the cards resembles the cards in an actual MONOPOLY™ game. Generally, the "Chance" and "Community Chest" outcomes comprise awards of fixed coin values (e.g., "BANK ERROR IN YOUR FAVOR, $100), or they can move the player to a new space (e.g., GO BACK ONE SPACE). If the player is moved to a property, the movement is indicated on the top box board 62 and the video display 12. The possible outcomes of the "Chance" and "Community Chest" squares in one embodiment of the MONOPOLY ONCE AROUND™ bonus game is shown in Table A-2, below.

TABLE A-2
CHANCE & COMMUNITY CHEST OUTCOMES

Community Chest	Pay		Chance	Pay
Beauty Contest	5		3rd Place in Dance Contest	7
Life Insurance Matures	25		Horse Wins the Derby	35
XMAS Fund Matures	15		You Win State Lottery	100
You Inherit Money	60		You Win at Roulette Table	25
Income Tax Refund	25		You Win at Blackjack Table	20
Bank Error in Your Favor	100		Lawsuit in your Favor	40
Receive Payment for Services	12		Find Lost Dog	10
Stock Increases in Value	40		Building and Loan Matures	30
Grand Opera Opening	9		Bank Pays You Dividend	12
Go Back One Space	0		Sell Rare Painting	70
Average	32.33		Average	34.9

Average with Go Back 1 Space	29.10			

In one embodiment of the MONOPOLY ONCE AROUND™ game, if the game token 40 lands on station(s) other than "Chance" or "Community Chest," the CPU 70 causes the player to be awarded an amount of credits corresponding to the product of the coins or credits wagered per line in the basic game and a multiplier value associated with the respective station(s). Four of the stations (e.g., "INCOME TAX," "IN JAIL," "GO TO JAIL" and "LUXURY TAX") have zero value in the bonus game, that is, they are associated with zero multiplier amounts. All other stations have positive integer multiplier values which generally increase as the token progresses farther along the board. The multiplier values associated with the respective stations are shown in FIG. 3 and Table A-3, below.

TABLE A-3
MONOPOLY BONUS SQUARES

MONOPOLY BONUS SQUARE	MULT	PROB	SNAKE EYES		Exp Pay	Exp Value	Cost/ House	House Pay	W/Snake Eyes		EV
Mediterranean Ave.	4	0.0028	0.002778		0.01	0.001%	5	75	1750		97.22%
Community Chest	29.10	0.0278%	0.027778		0.81	0.082%					
Baltic Avenue	5	0.0056	0.00008		0.28	0.028%	5	75	2500		87.19%
Income Tax	0	0.0843	0.00077		0.00	0.000%					
Reading Railroad	10	0.1144	0.00155		1.14	0.116%					
Oriental Avenue	10	0.1469	0.00234		1.47	0.169%	5	25	400		91.03%
Chance	34.9	0.1826	0.00318		6.37	0.646%					
Vermont Avenue	10	0.1669	0.00408		1.67	0.169%	5	25	150		93.63%
Connecticut Avenue	12	0.1560	0.00507		1.87	0.190%	5	25	175		93.21%
In Jail	0	0.1482	0.00463		0.00	0.000%					
St. Charles Place	15	0.1417	0.00433		2.13	0.215%	10	50	600		94.67%
Electric Company	12	0.1346	0.00412		1.62	0.164%					
States Avenue	15	0.1251	0.00394		1.88	0.190%	10	50	800		92.06%
Virginia Avenue	18	0.1389	0.00374		2.50	0.253%	10	50	700		93.76%
Pennsylvania Railroad	10	0.1462	0.00347		1.46	0.148%					
St. James Place	20	0.1488	0.00386		2.98	0.301%	10	50	500		91.74%
Community Chest	32.33	0.1483	0.00406		4.80	0.486%					
Tennessee Avenue	20	0.1461	0.00413		2.92	0.296%	10	50	500		91.64%
New York Avenue	22	0.1433	0.00412		3.15	0.319%	10	50	600		94.30%
Free Parking	10	0.1412	0.00406		4.80	0.486%					
Kentucky Avenue	25	0.1411	0.00398		3.53	0.357%	15	75	900		92.46%
Chance	34.9	0.1419	0.00392		4.95	0.502%					
Indiana Avenue	25	0.1429	0.00392		3.57	0.362%	15	75	900		93.01%
Illinois Avenue	28	0.1436	0.00394		4.02	0.407%	15	75	900		93.51%
B & O Railroad	10	0.1440	0.00397		1.44	0.146%					
Atlantic Avenue	30	0.1441	0.00399		4.32	0.438%	15	75	900		93.98%
Ventnor Avenue	30	0.1436	0.00400		4.31	0.436%	15	75	900		93.81%
Water Works	12	0.1432	0.00400		1.72	0.174%					
Marvin Gardens	35	0.1429	0.00399		5.00	0.507%	15	75	900		93.40%
Go to Jail	0	0.1429	0.00298		0.00	0.000%					
Pacific Avenue	50	0.1430	0.00397		7.15	0.724%	20	100	1200		93.36%
North Carolina Avenue	50	0.1432	0.00397		7.16	0.725%	20	100	1200		93.45%
Community Chest	32.73	0.1434	0.00397		4.64	0.469%					
Pennsylvania Avenue	60	0.1434	0.00398		8.60	0.871%	20	100	1200		93.58%
Short Line Railroad	10	0.1434	0.00398		1.43	0.145%					
Chance	34.9	0.1433	0.00398		5.00	0.506%					
Park Place	100	0.1432	0.00398		14.32	1.451%	20	100	1200		93.52%
Luxury Tax	0	0.1432	0.00398		0.00	0.000%					
Boardwalk	300	0.1432	0.00398		42.96	4.351%	20	100	1200		93.48%
Go	5	1.0000	0.00298		5.00	0.506%					
Total Spaces	39	6.2192									
Average	29.78	0.16									

Expected Value					167.60	16.97%					

In one embodiment, the bonus game gives the player the opportunity to make side bets, apart from the coins r credits wagered in the basic game, on the stations of the game board which the player predicts will be landed on during the bonus game. The increments of the side bets which may be made on the various stations may be varied according to the game program. For example, in the MONOPOLY ONCE AROUND™ bonus game, the player has the opportunity to "build" houses (make side bets) on the properties of the MONOPOLY board which the player predicts will be landed on during the bonus game. The amount of the side bet corresponds to the "cost" of the houses built on the various properties, which generally varies according to the property selected.

If the player wishes to build house(s), the player touches the "Build Houses" key 46 on the video display 12 (FIG. 5) which appears at the beginning of the bonus round. If the "Build Houses" key 46 is selected, the CPU 70 operates to display a "Build Houses" screen (FIG. 7) on the video display. In one embodiment, the video display 12 comprises a touch-screen display and the player bets (builds houses) on a property by touching the desired property. It will be appreciated, however, that any of several alternative player control devices may be used to implement the selection and building of houses.

After selection of a property, the CPU 70 operates to display a property deed 54 corresponding to the selected property on the video display 12. In FIG. 7, the property deed shown on the video display 54 is "Baltic Avenue," thus indicating that the player has elected to build houses on Baltic Avenue. More specifically, the player has identified the "Baltic Avenue" station as a predicted landing position of the token, to be determined by execution of the game program. The player builds houses on the selected property by touching the property again, by touching the deed 54, or by touching the "Build Houses" key 46. Up to five bets (houses) may be placed on each property. In one embodiment, the houses on the bottom side of the MONOPOLY™ board (from Mediterranean Ave. to Connecticut Ave.) cost 5 credits each, the houses on the left side of the board (St. Charles Place to New York Ave.) cost 10 credits each, the houses on the top side of the board (Kentucky Ave. to Marvin Gardens) cost 15 credits each and the houses on the right side of the board (Pacific Ave. to Boardwalk) cost 20 credits each.

The cost of the houses are subtracted from the credits previously earned or paid into the machine by the player. In one embodiment, the player may insert coins or bills into the machine 10 at any time during display of the "Build Houses" screen as desired to increase the credits available for building houses. If the player, having selected a property and placed house(s) on the

property, wants to clear the house(s) on the selected property, the player t uches a "Clear Property" key 48 on the display 12. If the player wants to clear h uses (side bets) placed on the entire board, the player touches a "Clear All Houses" key 50 on the display 12.

In one embodiment, the video display 12 displays a number of house and hotel icons corresponding to the number of houses built on each selected property. In FIG. 7, for example, the video display 12 shows four green house icons and a red hotel icon adjacent to the Baltic Avenue property deed, thus indicating that the player has placed five bets on Baltic Avenue. The four house icons represent the first four bets and the hotel icon represents the fifth bet placed on Baltic Avenue. The displayed property deed 54 identifies the cost per house (e.g., 5 credits for Baltic Avenue) and the pay value of landing on the property (e.g., 125 credits for Baltic Avenue, with five houses).

In one embodiment, the game program defines a target integer movement value and a bonus is awarded to the player if the player "rolls" the target integer movement value to land on the selected property. The bonus comprises a higher value award, greater than the award which would otherwise be awarded by landing on the selected property. In the illustrated embodiment, the target integer movement value is two, corresponding to a roll of "Snake Eyes" (double ones). The displayed property deed 54 indicates the pay value of the "Snake Eyes" bonus, 2000 credits for Baltic Avenue (with five houses). The cost per house, pay value per house and Snake Eyes bonus value per house for the various properties in one embodiment of the MONOPOLY ONCE AROUND™ game is identified in Table A-3.

In one embodiment, a "Help" key 44 is displayed on the "Build Houses" screen. If touched by the player, the "Help" key 44 allows the player to access various information and instructions associated with the build houses feature. For example, in one embodiment, the information associated with the "Help" key 44 may allow the player to determine how much the Snake Eyes bonus is worth for the various properties.

After the player has placed the desired number of side bets, the player touches a "Return to Game" key 52 on the display 12, causing the CPU 70 to replace the "Build Houses" screen with a display of the MONOPOLY board screen (FIG. 6) with the token starting on the GO square. Then, the player presses the "Roll Dice" button 41 or "Auto Roll" button 42 to roll the dice and commence the bonus game.

Then, the CPU 70 executes a game program, selecting integer movement values corresponding to a roll of dice to advance the game token, or token identifier along the game board. The landing station(s) of the token identifier determined by execution of the game program define "actual" or "true" position(s) of the token identifier, as opposed to the predicted

positions selected via the "Build Houses" screen. After each "roll," the CPU 70 compares the true position to the predicted position(s) and, if the true position matches any of the predicted position(s), the player is paid an amount of coins or credits, as appropriate, corresponding to the cost of building the house(s) on that property. In one embodiment, the amount paid upon landing on an improved property is five times the cost of building houses on that property. The "Build Houses" award(s), if any, are supplemental to the awards given as a result of landing on the properties in the regular bonus game.

The award of coin(s) or credit(s) for the "Build Houses" feature or the regular bonus game may occur immediately upon the token 40 landing on a particular property or may be deferred until completion of the bonus game. In one embodiment, the animated Rich Uncle Pennybags will celebrate on the display 12 during all large bonus awards. After the bonus game is complete, the bonus screen will fade and the video reels screen will then be displayed on the display 12 so the player may resuming playing the basic game.

Now turning to FIG. 8, there is depicted another gaming machine 110 with a board game theme. In one embodiment, the gaming machine 110 is operable to play a game entitled MONOPOLY REEL ESTATE™, based on the MONOPOLY™ board game. MONOPOLY™ is a registered trademark owned by and used with permission by Hasbro, Inc. and Hasbro International, Inc., Pawtucket, Rhode Island. Alternatively, the gaming machine 110 may be implemented with any of several other board game themes other than MONOPOLY™.

The gaming machine 110 includes a video display 112 and a top box display 132. The video display 112 may comprise a dot matrix, CRT, LED, LCD, electro-luminescent display or generally any type of video display known in the art. The top box display 132 has a facing surface 160 comprising a partially translucent material such as glass, plastic, Plexiglas or the like which includes an adaptation of a game board 162 (e.g., MONOPOLY) displayed thereon. The game board 162 is backlit by a number of lights 166 (not visible in FIG. 1) in the top box display 132.

FIG. 9 is a block diagram of a control system suitable for operating the slot machine 110 of FIG. 8. Coin/credit detector 182 signals a CPU 170 when a player has inserted a number of coins or played a number of credits. Then, after the player has activated a switch 184 (e.g., by pulling a lever or pushing a button), the CPU 170 operates to display reels 114, 116, 118, 120 and 122 (see FIG. 11) on the video screen 112. The player activates one or more selected paylines 172, 174, 176, 178, 180 and presses the "Spin Reels" button 136 or "Max Bet Spin" button 137 to "spin" the reels, as will be described in relation to FIG. 11. The CPU 170 randomly selects a game outcome and causes the video display 112 to display indicia (e.g., symbols on reels 114, 116, 118,

120 and 122) corresponding to the pre-selected game outcome. In on embodiment, the symb ls displayed on the reels define the basic game outcome.

A system memory 186 stores control software, operational instructions and data associated with the gaming machine 110. In one embodiment, the memory 186 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the memory 186 may be implemented on any of several alternative types of memory structures or may be implemented on a single memory structure. A payoff mechanism 188 is operable in response to instructions from the CPU 170 to award a payoff of coins or credits to the player in response to certain winning combinations stored in memory 186. As will be described in detail hereinafter, the payoff amounts corresponding to certain combinations is predetermined according to a pay table stored in system memory 186. A separate I/O controller 171 coupled to the CPU 170 operates the top box lights 266.

The gaming machine 110 is operable to play a basic game and a bonus game. The basic game is implemented on the video display 112 on five video simulated spinning reels, 114, 116, 118, 120 and 122 (hereinafter "reels") with five paylines 172, 174, 176, 178 and 180, as best observed in FIG. 11. Generally, game play is initiated by inserting a number of coins or playing a number of credits, causing the CPU 170 (FIG. 9) to activate a number of paylines corresponding to the number of coins or credits played. After activation of the paylines, the reels 114, 116, 118, 120 and 122 are set in motion by either pulling a lever (not shown), pressing a push button, or touching a touch screen "key" on the video display 112.

In the embodiment of FIG. 11, each of the paylines 172, 174, 176, 178 and 180 extend through one symbol on each of the five reels 114, 116, 118, 120 and 122. Payline 172 starts at the upper left symbol (e.g., "TRAIN") on reel 114, extends through the center symbol (e.g., "WATER WORKS," hereinafter "WATER") on reel 116, the lower symbol (e.g., "WATER") on reel 118, the center symbol (e.g., "TRAIN") on reel 120 and terminates at the top symbol (e.g., "HAT") on reel 122. Payline 174 extends through the top symbol on each reel (e.g., "TRAIN" on reel 114, "ELECTRIC COMPANY," hereinafter "LIGHT" on reel 116, "COMMUNITY CHEST," hereinafter "CHEST" on reel 118, "RICH UNCLE PENNYBAGS," hereinafter "PENNY" on reel 120 and "HAT" on reel 122.) Payline 176 extends through the center symbol on each reel (e.g., "FREE PARKING," hereinafter "PARKING" on reel 114, "WATER" on reel 116, "DOG" on reel 118, "TRAIN" on reel 120 and "LIGHT" on reel 122.) Payline 178 extends through the lower symbol on each reel (e.g., "PENNY" on reel 114, "CHANCE" on reel 116, "WATER" on reel 118, "CAR" on reel 120 and "PARKING" on reel 122.) Payline 180 starts at the lower symbol (e.g., "PENNY") on reel 114, extends through the center symbol (e.g., "WATER") on reel 116,

the upper symbol (e.g., "CHEST") n reel 118, the center symbol (e.g., "TRAIN") on reel 120 and terminates at the lower symbol (e.g., "PARKING") on reel 122.

In one embodiment, the player selects the number of paylines (between ne and five) to play by pressing one of the five buttons in the top row 128 or by using the "Select Lines" key 134 on the video display 112. The player then chooses one of the five buttons in the bottom row 130 that correspond to the number of coins or credits to bet on each of the five paylines. Selecting one of the buttons in the bottom row 130 sets the five video reels, 114, 116, 118, 120 and 122 in "motion". As an alternative, the player may touch the "Bet Per Line" key 135 on the video display 112 until the desired bet is displayed and then touch the "Spin Reels" key 136 on the video display 112 to begin the game. As another alternative, if the player wishes to bet the maximum amount of lines and the maximum bet per line, the player may touch the "Max Bet Spin" key 137 on the video display 112 to begin the game. In one embodiment, the game can be set for a maximum bet of 5, 9 or 18 credits on each payline for a maximum total bet of 25, 45 or 90 credits per game. The CPU 70 assigns an equal amount of credits bet for each payline and then spins all five reels 114, 116, 118, 120 and 122.

The CPU 170 uses a random number generator (not shown) to select a game outcome (e.g., "basic" game outcome) corresponding to a particular set of reel "stop positions". The CPU 170 then causes each of the video reels 114, 116, 118, 120 and 122 to stop at a preselected stop position. Video symbols (see FIG. 11) are displayed on the reels 114, 116, 118, 120 and 122 to graphically illustrate the reel stop position and indicate whether the stop position of the reels represents a winning game outcome. Winning "basic" game outcomes (e.g., symbol combinations resulting in payment of coins or credits) are identifiable by a pay table (see Table B-1). In one embodiment, the pay table is affixed to the machine 110 and/or displayed by the video display 112 in response to a command by the player (e.g., by pressing the "PAY TABLE" button 145). The pay table enables the player to view the winning combinations and their associated payoff amounts. If the displayed symbols stop in a winning combination, the game awards the player the award corresponding to the award in the pay table for that combination multiplied by the amount of credits bet on the winning payline.

Table B-1 – Pay Table for REEL ESTATE Basic Game

TYPE: 5 REEL													MaxBet:	25/45/90
Win Combination					R #1	R #2	R #3	R #4	R #5	# OF HITS	PAY	TOTAL	PROB	EV
PENNYBAGS					1	1	1	1	1					
PENNY	PENNY	PENNY	PENNY	PENNY	1	1	1	1	1	1	10000	10000	8.417E-08	0.08%
PENNY	PENNY	PENNY	PENNY		1	1	1	1	24	24	1000	24000	2.02E-06	0.20%
PENNY	PENNY	PENNY			1	1	1	22	26	566	100	56600	4.764E-05	0.48%
PENNY	PENNY				1	1	17	26	26	11492	10	114920	0.0009672	0.97%
PENNY					1	17	26	26	26	298792	2	597584	0.0251479	5.03%

TYPE: 5 REEL													25+45/90
Win Combinations					R #1	R #2	R #3	R #4	R #5	# OF HITS	PAY	TOTAL	PROB	EV
CAR					1	2	2	2	1					
CAR	CAR	CAR	CAR	CAR	2	3	3	3	2	107	1000	107000	9.006E-06	0.90%
CAR	CAR	CAR	CAR		2	3	3	3	24	1272	150	190800	0.0001071	1.61%
CAR	CAR	CAR			2	3	3	23	26	10185	50	508300	0.0008556	4.28%
CAR	CAR				2	3	23	26	26	77740	5	388700	0.006543	3.27%
CAR					2	23	26	26	26	404249	2	808498	0.03402237	6.80%
CAR														
HAT					3	3	3	1	1					
HAT	HAT	HAT	HAT	HAT	4	4	4	2	2	254	500	127000	2.136E-05	1.07%
HAT	HAT	HAT	HAT		4	4	4	2	24	3048	100	304800	0.0002565	2.57%
HAT	HAT	HAT			4	4	4	24	26	39312	30	1179360	0.0033087	9.93%
HAT	HAT				4	4	22	26	26	223080	2	446160	0.01877756	3.76%
HAT														
DOG					3	3	3	3	1					
DOG	DOG	DOG	DOG	DOG	4	4	4	4	2	510	300	153000	4.292E-05	1.29%
DOG	DOG	DOG	DOG		4	4	4	4	24	8048	60	362880	0.0005059	3.05%
DOG	DOG	DOG			4	4	4	22	26	36036	20	720720	0.0030033	6.07%
DOG	DOG				4	4	22	26	26	223080	2	446160	0.01877756	3.76%
DOG														
TRAIN					4	4	3	4	4					
TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	4	4	3	4	4	768	120	92160	6.464E-05	0.78%
TRAIN	TRAIN	TRAIN	TRAIN		4	4	3	4	22	4224	40	168960	0.0003555	1.42%
TRAIN	TRAIN	TRAIN			4	4	3	22	26	27456	15	411840	0.0023108	3.47%
TRAIN														
PARKING					4	4	4	5	4					
PARKING	PARKING	PARKING	PARKING	PARKING	4	4	4	5	4	1280	100	128000	0.0001077	1.08%
PARKING	PARKING	PARKING	PARKING		4	4	4	5	22	7040	30	211200	0.0005925	1.78%
PARKING	PARKING	PARKING			4	4	4	21	26	34944	12	419328	0.0029411	3.53%
PARKING														
WATER					4	4	4	4	5					
WATER	WATER	WATER	WATER	WATER	4	4	4	4	5	1280	80	102400	0.0001077	0.86%
WATER	WATER	WATER	WATER		4	4	4	4	21	5376	25	134400	0.0004525	1.13%
WATER	WATER	WATER			4	4	4	22	26	38808	10	388080	0.0030811	3.08%
WATER														
LIGHT					4	3	4	4	6					
LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	4	3	4	4	6	1152	80	88120	9.696E-05	0.58%
LIGHT	LIGHT	LIGHT	LIGHT		4	3	4	4	20	3840	20	76800	0.0003232	0.65%
LIGHT	LIGHT	LIGHT			4	3	4	22	26	27456	5	137280	0.0023108	1.16%
														74.80%
SCATTERED PAYS														
CHEST					1	1	1	1	1					
CHEST	CHEST	CHEST	CHEST	CHEST	3	3	3	3	3	243	50	12150	2.045E-05	0.10%
CHEST	CHEST	CHEST	CHEST		3	3	3	3	23	1863	10	18630	0.0001568	0.16%
	CHEST	CHEST	CHEST	CHEST	23	3	3	3	3	1863	10	18630	0.0001568	0.16%
CHEST	CHEST	CHEST			3	3	3	23	26	16146	2	32292	0.0013588	0.27%
	CHEST	CHEST	CHEST		23	3	3	3	23	14283	2	28566	0.0012021	0.24%
		CHEST	CHEST	CHEST	26	23	3	3	3	16146	2	32292	0.0013588	0.27%
CHANCE					1	1	1	1	2					
CHANCE	CHANCE	CHANCE	CHANCE	CHANCE	3	3	3	3	6	486	50	24300	4.09E-05	0.20%
CHANCE	CHANCE	CHANCE	CHANCE		3	3	3	3	20	1820	10	18200	0.0001363	0.14%
	CHANCE	CHANCE	CHANCE	CHANCE	23	3	3	3	6	3726	10	37260	0.0003136	0.31%
CHANCE	CHANCE	CHANCE			3	3	3	23	26	16146	2	32292	0.0013589	0.27%
	CHANCE	CHANCE	CHANCE		23	3	3	3	20	12420	2	24840	0.0010453	0.21%
		CHANCE	CHANCE	CHANCE	26	23	3	3	6	32292	2	64584	0.0027179	0.54%
													0.8987%	2.69%
				TOTAL	26	26	26	26	26	1169443		12000084		3.43%

Table B-1 is a pay table identifying various winning combinations of symbols in the MONOPOLY REEL ESTATE™ basic game and their mathematical probabilities and expected values. The various symbols used in the MONOPOLY REEL ESTATE™ basic game include: "RICH UNCLE PENNYBAGS" ("PENNY"), "CAR," "HAT," "DOG," "TRAIN," "PARKING," "WATER," "LIGHT," "CHEST" and "CHANCE."

The "WIN COMBINATIONS" column identifies the various win combinations which may occur by symbols stopping on an active payline. Generally, winning combinations can occur when one to five corresponding symbols are displayed, left to right, starting on reel 114

(designated "R #1" in Table B-1) on an active payline. For example, ne "PENNY" symbol displayed on reel 114 is a winning outcome, as is two "PENNY" symbols displayed on adjacent reels 114 ("R #1") and 116 ("R #2").

In one embodiment, the "PENNY" symbol acts as a wildcard for combinations of game tokens "CAR," "HAT" and "DOG." Thus, for example, the combination of "CAR," "PENNY" and "CAR" on adjacent reels 114 ("R #1"), 116 (R #2) and 118 (R #3) is a winning combination.

The "SCATTERED PAYS" column identifies the various win combinations which may occur by symbols which are not necessarily aligned with an active payline. A winning combination of the scatter-pay type occurs when scatter-pay symbols are displayed, in any position, on the appropriate reels. In the MONOPOLY REEL ESTATE™ basic game, the "CHEST" and "CHANCE" symbols are scatter-pay symbols and winning combinations occur when three or more of these symbols are displayed on adjacent reels. For example, three "CHEST" symbols displayed on adjacent reels 116 ("R #2"), 118 (R #3) and 120 (R #4), is a winning scatter-pay combination in the MONOPOLY REEL ESTATE™ game.

The "# OF HITS" column of Table B-1 identifies, for each winning combination, the product of the number of symbols on each reel supporting the combination. For example, consider the combination of five "PENNY" symbols. This combination is the highest value combination in the MONOPOLY REEL ESTATE™ basic game because there are relatively few "PENNY" symbols on each reel and, consequently, the probability of hitting a "PENNY" symbol on each reel is very low. Specifically, in the embodiment of Table B-1, there is one "PENNY" symbol on each of reels 114 ("R #1"), 116 ("R #2"), 118 ("R #3"), 120 ("R #4") and 122 ("R #5"). Thus, the "# OF HITS" for the combination of five consecutive "PENNY" symbols is 1 (i.e., 1 x 1 x 1 x 1 x 1).

The "PAY" column of Table B-1 identifies the amount of coin(s) or credit(s) awarded for the various winning combinations in the basic game, per unit wagered. Thus, for example, the "PENNY," "PENNY" combination appearing on reels 114, 116 ("R #1, R #2") will pay 10 coins or credits with one coin played; that same combination will pay 50 coins or credits with five coins played.

The "TOTAL" column of Table B-1 lists, for each winning combination, the product of the "# OF HITS" value and the "PAY" value. The five "PENNY" combination, for example, having 1 hit paying 10,000 coins or credits, has a "TOTAL" value of 10,000. As another example, the four "PENNY" combination, having 24 hits paying 1,000 coins or credits, has a "TOTAL" value of 24,000.

In one embodiment, each f the reels 114, 116, 118, 120 and 122 have 26 symbol p sitions, thus the odds of hitting each unique combination relative to a single active payline is ne in about 12 million (i.e., $1 \div (26)^5$). The "PROB" column identifies the probability of hitting the various winning combinations in a single spin. For example, there is only 1 symbol combination out of about 12 million symbol combinations that will result in the combination of five consecutive "PENNY" symbols. Thus, the probability of hitting that combination is 1 ÷ 12 million or about 8.4×10^{-8}.

The "EV" column of Table B-1 identifies the expected value of the various winning combinations, which is computed as the product of the "PAY" and "PROB" values. Thus, for the five "PENNY" combination, the expected value is 0.08% ($10{,}000 \times 8.4 \times 10^{-8}$). The payout rate of the basic game, identified at the bottom of the "EV" column, is computed by summing each of the expected values. In the embodiment of Table B-1, the payout rate of the basic game is 74.6%

The Bonus Game

The bonus game is triggered when a special "start-bonus" outcome occurs in the basic game. In one embodiment of the MONOPOLY REEL ESTATE™ game, the bonus game is triggered when three or more "CHEST" or "CHANCE" symbols are displayed in scatter-pay format on adjacent ones of the reels 114, 116, 118, 120 and 122. Alternatively, depending on the game program, the bonus game might be triggered when the "CHEST" or "CHANCE" symbols are displayed on an active payline on the reels 114, 116, 118, 120 and 122. The bonus game has a board-game (e.g., MONOPOLY) theme and is implemented on the top box game board 162 and video display 112.

Upon initially entering the bonus game, the CPU 170 operates to replace the display of reels 114, 116, 118, 120, 122 on video display 112 with a token selection screen (FIG. 12) offering a selection of board game tokens 140. In the MONOPOLY REEL ESTATE™ game, the token selection screen displays an animated Rich Uncle Pennybags symbol 138 above a selection of MONOPOLY tokens 140 (e.g., "CAR," "DOG," "HORSE," "SHOE" and "HAT"), and the player is prompted to select one of the game tokens 140. In one embodiment, the video display 112 comprises a touch-screen display and the selection of a game token 140 is accomplished by touching the desired token on the display 112. It will be appreciated, however, that any of several known player control devices may be used to implement the selection of a token 140. In another embodiment, the player scrolls through the tokens 140 and selects a particular token by depressing a designated "select" button on the gaming machine 110 when the desired token 140 is highlighted. Scrolling through the tokens 140 prior to the selection of the desired token may also be

accomplished automatically according to the game program or may be controlled by the player pressing various buttons. Once the player selects a token 140,

Once the player selects a token 140, the CPU 170 signals the I/O controller 171 to illuminate a starting station on the top box game board 162 and then illuminate successive stations around the board in step-wise fashion, rapidly at first and then, after a couple of revolutions, slowing down and stopping on an indicated station. Generally, the indicated station is randomly determined by the CPU 170 prior to the illumination of successive stations on the top box game board 162. At a certain point, as the light on the top box game board 162 begins slowing down, the CPU 170 operates to generate a corresponding display on the video display 112, in which the selected token 140 "moves" on a scrolling portion of the game board before ultimately stopping on the indicated station. The movement of the game token 140 on the video display 112 corresponds exactly to the illumination of stations on the top box game board 162.

For example, in the MONOPOLY REEL ESTATE™ game, once the player selects a token, the stations (squares) of the top box MONOPOLY board 162 are illuminated in step-wise fashion, starting with the GO square. The illumination of stations starts rapidly, then slows down and stops to reveal an indicated station of the MONOPOLY board. On the corresponding video display 112 (FIG. 13), the selected MONOPOLY token 140 (e.g., "HORSE") is shown advancing on a scrolling MONOPOLY board and then stopping on the indicated station (e.g., the "GO" square in FIG. 13).

In one embodiment, when the token 140 "lands" on the indicated station, an animated character icon (e.g., Rich Uncle Pennybags, in the MONOPOLY REEL ESTATE™ game) announces the name of the indicated station and the player is awarded an amount associated with the station. If the game token 140 lands on a "Chance" or "Community Chest" square, the CPU 170 triggers an animation on video display 112 which shows the top card of a pile of cards flipping up to reveal the "Chance" or "Community Chest" outcome. The art on the cards resembles the cards in an actual MONOPOLY™ game. Generally, the "Chance" and "Community Chest" outcomes comprise awards of fixed coin values (e.g., "LIFE INSURANCE MATURES, $12), or they move the player to a new space (e.g., ADVANCE TO BOARDWALK). If the player is moved to a property, the movement is indicated on the top box board 62 and the video display 12. The possible outcomes of the "Chance" and "Community Chest" squares in one embodiment of the MONOPOLY REEL ESTATE™ bonus game is shown in Table B-2, below.

TABLE B-2
Chance and Community Chest Outcomes/Pay Values

Community Chest	Pay		Chance	Pay
Beauty Contest	3		Your Win 3rd Place in Dance Contest	4
Life Insurance Matur s	12		Your Horse Wins the Derby	12
XMAS Fund Matures	8		You Win State Lottery	25
You Inherit Money	15		Your Number Hits at Roul tte Wheel	15
Income Tax Refund	9		Lawsuit in your Favor	12
Bank Error In Your Favor	25		Find Lost Dog	3
Receive For Services	6		Your Build and Load Matures	10
From Sale of Stock You Get	10		Bank Pays You Dividend	8
Grand Opera Opening	5		Sell Rare Painting at Auction	10
Advance to Boardwalk	50		Advance to Park Place	30
Average	14.30		Average	12.90

In one embodiment of the MONOPOLY REEL ESTATE™ game, if the game token 140 lands on station(s) other than "Chance" or "Community Chest," the CPU 170 causes the player to be awarded an amount of credits corresponding to the product of the coins or credits wagered in the basic game and a multiplier value associated with the respective station(s). All of the stations have positive integer multiplier values which generally increase as the token progresses farther along the board. The multiplier values associated with the respective stations are shown in FIG. 10 and Table B-3, below.

Table B-3 – MONOPOLY BONUS SQUARES

		Number of Scatter Symbols in Win					
MONOPOLY BONUS	Mult	No monos	Weight			EV	EV w/Bonus
Mediterranean	3	0.667	1	1		0.02%	0.03%
Community Chest	14.30	0.967	2			0.24%	0.27%
Baltic	3	0.667	1	1		0.02%	0.03%
Income Tax	2	1.000	2			0.03%	0.04%
Reading Railroad	10	1.000	2			0.16%	0.19%
Oriental	4	0.818	2	2		0.07%	0.07%
Chance	12.90	0.967	2			0.215	0.24%
Vermont	4	0.818	2	2		0.07%	0.07%
Connecticut	5	0.818	2	2		0.08%	0.09%
Jail	2	1.000	2		18	0.03%	0.04%
St. Charles	6	0.818	2	2		0.10%	0.11%
Electric Company	12	1.000	2			0.20%	0.22%
States Ave	6	0.818	2	2		0.10%	0.11%
Virginia Avenue	7	0.818	2	2		0.12%	0.13%
Pennsylvania RR	10	1.000	2			0.16%	0.19%
St. James Place	8	0.818	3	3		0.20%	0.22%
Community Chest	14.30	0.967	2			0.24%	0.27%
Tennessee Ave	8	0.818	3	3		0.20%	0.22%
New York Ave	9	0.818	3	3		0.22%	0.25%
Free Parking	4	1.000	2		23	0.07%	0.07%
Kentucky Ave	10	0.818	3	3		0.25%	0.28%
Chance	12.90	0.967	1			0.11%	0.12%
Indiana Ave	10	0.818	3	3		0.25%	0.28%
Illinois Ave	12	0.818	3	3		0.30%	0.34%
B & O Railroad	10	1.000	3			0.25%	0.28%
Atlantic Ave	15	0.818	4	4		0.49%	0.56%
Ventnor Ave	15	0.818	4	4		0.49%	0.56%
Water Works	12	1.000	4			0.395	0.45%
Marvin Gardens	16	0.818	4	4		0.59%	0.67%

Go to Jail	2	1.000	4		33	0.07%	0.07%
Pacific Ave	20	0.818	4	4		0.66%	0.75%
North Carolina Ave	20	0.818	4	4		0.66%	0.75%
Community Chest	14.30	0.967	4			0.47%	0.53%
Pennsylvania Ave	25	0.818	4	4		0.82%	0.93%
Short Line	10	1.000	5			0.41%	0.47%
Chance	12.90	0.967	5			0.53%	0.60%
Park Place	30	0.667	5	5		1.23%	1.40%
Luxury Tax	2	1.000	5			0.08%	0.09%
Boardwalk	50	0.667	5	5		2.06%	2.34%
Go	10	1.000	5	0.55	46	0.41%	0.47%
Total Spaces	40		120	Total		13.05%	14.83%
Expected Value	13.05%	0.115					
Bonus Spins		1	2	3	4	Extra Spins	Total
Chance of Bonus Spins	1.0000	0.1202	0.0144	0.0017	0.0002	1.1365	
Expected Value of Bonus Spins	13.0459%	1.5675%	0.1883%	0.0226%	0.0027 %	1.78%	14.83%

The bonus game nominally consists of only one indicated outcome ("spin") resulting in a single bonus award, after which the CPU 170 returns to the basic game. In one embodiment, an animated Rich Uncle Pennybags will celebrate on the video display 112 during all large bonus awards. After the bonus game is complete, the CPU 170 causes the bonus screen to fade and the video reels to be displayed so the player may resume playing the basic game.

In one embodiment, certain of the stations of the game board 162 have characteristics which identify them as members of a discernible subset or group of the stations. For example, in the MONOPOLY REEL ESTATE™ game, as in the actual MONOPOLY board game, the various properties of the game board are associated with color groups: Mediterranean Ave. and Baltic Ave. define a purple color group, Oriental Ave, Vermont Ave. and Connecticut Ave. define a light blue color group and so forth. In one embodiment, additional spins may be awarded by "completing" all the stations of a particular color group. Upon each play of the bonus game, if the token 140 lands on a station (e.g., property square) that is part of a color group, the CPU 170 identifies the station as a "completed" station and stores the outcome of that spin in game memory. Then, in one embodiment, the CPU 170 causes the I/O controller 171 to light an indicator light associated with that property on the game board 162, thereby indicating that the property is a "completed" property.

After each movement of the token, or token identifier, on the game board 162, the CPU 170 assigns a "completed" status to the landing station, as appropriate, then evaluates the status of the other stations in the group. If the other stations in the group also have been completed, the CPU 170 identifies that group as a completed group and provides a reward to the player. The reward might comprise an additional bonus game "spin" or an enhanced payoff relative to the base value of the property landed on. For example, if the token lands on Mediterranean Ave., which is a member of the purple color group, the CPU 170 assigns a completed status to the Mediterranean Avenue station and then evaluates the status of the other purple station, Baltic

Avenue. Continuing the present example, if Baltic Avenue were also "c mpleted," the CPU 170 would identify the purple group as a completed group and reward the player as appropriate, with perhaps an additional bonus game "spin." Alternatively or additionally, other incentives might be provided for completing color groups. For example, in one embodiment, if a player's token 140 lands on a property space that completes a color group, the player might be awarded double the value otherwise associated with that property. For instance, Mediterranean Avenue in one embodiment is associated with a "3X" multiplier, and the CPU 170 might cause the payoff to be doubled, effectively to a "6X" multiplier upon the game token landing on Mediterranean Avenue and completing the purple color group.

In one embodiment, once a station is completed, it retains its completed status (and its indicator light remains lit) when the bonus round ends and throughout additional bonus rounds until such time as all of the stations in that group are completed, thus defining a completed group. The bonus game might be played several times, by several players, before completing any station groups. Upon the completion of a group, the CPU 170 rewards the player as appropriate and then removes the completed status of the stations in the station group, causing the indicator lights to be extinguished.

For example, in the MONOPOLY REEL ESTATE™ game, a first player might enter the bonus game five times landing, respectively, on Illinois Ave. (red), Ventnor Ave. (yellow), Community Chest (no color), St. James Place (orange) and Pacific Ave. (green), causing the CPU 170 to assign completed status and illuminate indicator lights associated with those properties. A second player might then enter the bonus game three times, landing respectively on North Carolina Ave. (green) and Tennessee Ave. (orange), again causing the CPU 170 to assign completed status and illuminate indicator lights associated with those properties. A third player might then enter the bonus game and land on New York Ave. (orange), thus completing the orange color group. After identifying that New York Ave. is completed and that it completes the orange color group, the CPU 170 might then award the player a free bonus spin and clear or remove the completed status and extinguish the indicator lights on the orange properties. If the player were to land on Pennsylvania Ave. (green) in the free spin, thus completing the green color group, the CPU 170 would award the player another free bonus spin, clear the completed status and extinguish the indicator lights on the green properties. Otherwise, any other outcome would cause the CPU 170 to end the bonus game and return to the basic game.

In one embodiment, the free spin feature has a relatively low total payback of 1.9%, so that players will not feel compelled to keep playing the game until completing a color group (or conversely, to immediately leave the game after completing a color group), and so that other

players will not be enticed to "sit out" and wait for machines which have a large proporti n of lit properties.

Now turning t FIG. 14, there is depicted another gaming machine 210 with a board game theme. In one embodiment, the gaming machine 210 is operable to play a game entitled MONOPOLY ADVANCE TO BOARDWALK™, based on the MONOPOLY™ board game. MONOPOLY™ is a registered trademark owned by and used with permission by Hasbro, Inc. and Hasbro International, Inc., Pawtucket, Rhode Island. Alternatively, the gaming machine 210 may be implemented with any of several other board game themes other than MONOPOLY™.

The gaming machine 210 includes a display window 270 through which a player may observe three mechanical reels, 214, 216 and 218. The gaming machine 210 includes a top box 232 which includes a graphics display 212 and an adaptation of a game board 262 (e.g., MONOPOLY). The graphics display 12 may comprise a dot matrix, CRT, LED, LCD, electro-luminescent display or generally any type of video display known in the art. The game board 262 comprises a partially translucent material such as glass, plastic, Plexiglas or the like which is backlit by a number of lights 266 (not visible in FIG. 14) in the top box 232. As best observed in FIG. 16a, the facing surface 260 of the top box is imprinted with various artwork, symbols and text associated with the MONOPOLY ADVANCE TO BOARDWALK™ game, including a pay table 250 and instruction table 252. The game board is partitioned so that different sections can be independently lit.

FIG. 15 is a block diagram of a control system suitable for operating the slot machine 210 of FIG. 14. Coin/credit detector 282 signals a CPU 270 when a player has inserted a number of coins or played a number of credits. Then, after the player has activated a switch 284 (e.g., by pulling a lever or pushing a button), the CPU 270 initiates game play by setting reels 214, 216, 218 in motion, randomly selecting a game outcome and, using technology well known in the art, causes a reel motor and step controller 290 to stop the reels 214, 216, 218 at a stop position corresponding to the pre-selected game outcome. A rotational position detector 292 provides feedback to the CPU 270 to ensure that the reels 214, 216, 218 are stopped at the correct stop position. The symbols displayed on the reels at the preselected stop position define indicia of the pre-selected game outcome. In one embodiment, the symbols displayed on the reels define the basic game outcome.

A system memory 286 stores control software, operational instructions and data associated with the gaming machine 210. In one embodiment, the memory 286 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the memory 286 may be implemented on any of several alternative types of

memory structures or may be implemented on a single memory structure. A payoff mechanism 288 is operable in response to instructions from the CPU 270 to award a payoff of coins or credits to the player in response to certain winning combinations stored in memory 286. As will be described in detail hereinafter, the payoff amounts corresponding to certain combinations is predetermined according to a pay table stored in system memory 286. A separate I/O controller 271 coupled to the CPU 270 operates the graphics display 212 and top box lights 266.

The gaming machine 210 is operable to play a basic game and a bonus game. In the embodiment of FIG. 14, the basic game is implemented on the three mechanical reels, 214, 216, 218 with a center payline 276. In one embodiment, the player can observe three symbol positions (e.g., an upper, center and lower display position) on each reel 214, 216, 218 thus defining a symbol group of nine symbols visible through the display window 270. Payline 276 extends through the center display position on each reel.

In one embodiment, the symbol group displayed on reels 214, 216, 218 may indicate any of four possible basic game outcomes, including (1) a standard winning outcome causing the CPU 270 to award the player a predetermined amount of coin(s) or credit(s) corresponding to a displayed pay table; (2) a surprise winning outcome causing the CPU 270 to award the player a predetermined amount of coin(s) or credit(s) corresponding to a "surprise" winning outcome not identified on a displayed pay table; (3) a start-bonus outcome causing the CPU 270 to enter a bonus game; and (4) a losing outcome causing the processor 40 to continue operation in the basic mode without awarding any coin(s) or credit(s).

Generally, both the standard and surprise winning outcomes are characterized by the display of one or more predefined combinations of symbols. The symbols and payoffs defining the standard and surprise winning combinations are stored in the game memory 286. In one embodiment, the symbols and payoffs defining the standard winning combinations are shown in the pay table 250 (FIG. 16a) on the face of the slot machine 210 so that they may be observed by the player, whereas the symbols defining the surprise winning combinations are not shown on the top box 232 and hence will likely "surprise" the player when they result in a payoff. In the MONOPOLY ADVANCE TO BOARDWALK™ game, the symbols defining the surprise winning combinations are identified only generally on the top box 232 as a "mystery blank combination" which starts the ADVANCE TO BOARDWALK™ bonus game. The specific combination of BLANK symbols which define the "mystery blank combination" is predefined and stored in game memory 286.

The symbols defining the start-bonus combinations are preferably identified on the pay table or other portion(s) of the top box display 232. For example, as will be described in greater

detail hereinafter, the MONOPOLY ADVANCE TO BOARDWALK™ game has tw bonus features: a CHANCE bonus feature and an ADVANCE TO BOARDWALK b nus feature. In th embodiment of FIG. 16a, the CHANCE bonus feature and the symbols (i.e., start-bonus combinations) which trigger the CHANCE bonus feature are explained in the text underlying the CHANCE icon at the center-left of the top box display 232. Specifically, the display 232 includes the following description of the CHANCE bonus feature in the illustrated embodiment:

> CHANCE SYMBOL matches only 7's and BARS on the payline. When CHANCE symbol is in a winning combination, the CHANCE BONUS FEATURE starts in the display. The CHANCE BONUS is a randomly awarded multiplier from 2-10 or 2-25 bonus coins. CHANCE SYMBOL does not substitute for WILD.

The ADVANCE TO BOARDWALK bonus feature and the symbols (i.e., start-bonus combinations) which trigger the ADVANCE TO BOARDWALK bonus feature are explained in the field 252 at the lower-right of the top box display 232, as follows:

> THREE RICH UNCLE MONEYBAGS in any position starts the ADVANCE TO BOARDWALK GAME. Player starts on 'GO'. A random number shown on the display will move the player around the board. Player collects the displayed coins on each space landed upon. Player continues accumulating coins until the player lands on a 'GAME OVER SPACE', or has been awarded the '6th PASS GO' BONUS. Drawing a 'GO TO JAIL' CARD from CHANCE or COMMUNITY CHEST will send the player to the 'IN JAIL' space, ENDING the BONUS BOARD GAME. GOING TO JAIL does not award 'PASS GO' Bonuses. CHANCE and COMMUNITY CHEST board squares award 5-50 credits. Mystery blanks combination start the Advance to Boardwalk Game. PASS GO SIX TIMES AND WIN OVER 2,100 COINS.

FIG. 17 shows a set of reel strips for use with the slot machine 210 to implement the MONOPOLY ADVANCE TO BOARDWALK™ game. The reel strips correspond to the reels 214, 216, 218 in FIG. 14 and will be identified by corresponding reference numerals 214, 216, 218. Each of the reel strips 214, 216, 218 include twenty-four symbols (including blanks) corresponding to twenty-four available reel stopping positions. The symbols include WILD, SEVEN, CHANCE, 3-BAR, 2-BAR, 1-BAR, BLANK and CHERRY which, if displayed in certain predefined combinations relative to payline 22, define the standard and surprise winning combinations. Three of the BLANK symbols on each reel define mystery blanks which, if aligned on the payline, will trigger a "surprise" winning outcome Also shown on the reel strips 214,216,218 are small RICH UNCLE PENNYBAGS (hereinafter "PENNY") symbols which are displayed on top of (and thereby share the same reel stopping position as) some of the other symbols. In one embodiment, the

PENNY symbols do not form the basis of standard winning combinations in the basic game but instead define start-bonus combination(s), if displayed in scatter-pay format on the reels 214, 216, 218. This is achieved in hardware by treating the blank symbols above and below the PENNY symbol as special symbols. If any of those special symbols or the PENNY symbols appear on the payline, this is equivalent to a PENNY symbol appearing in one of the three scatter-pay positions on the reels.

Specifically, the symbols which appear on reel strip 214 include, in sequence 3-BAR, Blank, 1-BAR, Blank, SEVEN, Blank, 1-BAR, Blank, 3-BAR/PENNY, Blank, 1-BAR, Blank, 2-BAR, Blank, 1-BAR, Blank, 3-BAR, Blank, 2-BAR/PENNY, Blank, 1-BAR, Blank, 2-BAR and Blank. The symbols which appear on reel strip 216 include, in sequence, 3-BAR, Blank, Blank/PENNY, Blank, 2-BAR, Blank, SEVEN, Blank, 1-BAR, Blank, 2-BAR, Blank, WILD/PENNY, Blank, 2-BAR, Blank, CHERRY, Blank, 1-BAR, Blank, CHANCE, Blank, 1-BAR and Blank. Finally, the symbols which appear on reel strip 218 include, in sequence, 3-BAR, Blank, 2-BAR, Blank, 1-BAR, Blank, SEVEN/PENNY, Blank, 1-BAR, Blank, 2-BAR, Blank, 1-BAR, Blank, 2-BAR, Blank, 1-BAR, Blank, 2-BAR, Blank, 1-BAR, Blank, 2-BAR and Blank.

TABLE C-1
Pay Table for ADVANCE TO BOARDWALK Basic Game

			1st COIN	2nd COIN	3rd COIN	4th COIN
SEVEN	WILD	SEVEN	200	400	1000	3 RICH UNCLE PENNYBAGS in any position starts the ADVANCE TO BOARDWALK bonus game.
SEVEN	SEVEN	SEVEN	70	140	210	
3BAR	3BAR	3BAR	40	80	120	
2BAR	2BAR	2BAR	20	40	60	
1BAR	1BAR	1BAR	10	20	30	
anyBAR	anyBAR	anyBAR	5	10	15	
-	CHERRY	-	2	4	6	(further disclaimers below)
-	WILD	-	1	2	3	

Table C-1 is a pay table identifying various winning combinations of symbols in the MONOPOLY ADVANCE TO BOARDWALK™ game. The winning combinations include various standard symbol combinations (e.g., SEVEN, WILD, SEVEN) and start-bonus combinations (e.g., "Three Rich Uncle Pennybags Starts the Advance to Boardwalk Bonus Game). In one embodiment, the game accepts from one to four coins. The winning standard combinations can occur for any number of one to four coins played if the indicated symbols are displayed on reels 214, 216, 218 in alignment with the center payline 276. For example, three "1-BAR" symbols displayed on reels 214, 216, 218 on the center payline 276 is a standard winning combination which will pay 10 credits for 1 coin played, 20 credits for 2 coins played and 30 credits for 3 or 4 coins played. The "Any Bar" combination is satisfied by any combination of three or more "1-BAR," "2-BAR" and "3-BAR" symbols stopping on the center payline 276.

In one embodiment, the "WILD" symbol acts as a wildcard for all of the BAR combinations. Thus, f r example, the combination of "2-BAR," "WILD" and "2-BAR" is a standard winning combination which w uld pay the same as the combination of three "2-BAR" symbols, corresponding to the number of coins played. In one embodiment, the "CHANCE" symbol acts as a wildcard for "SEVEN" and "BAR" combinations and also triggers the CHANCE bonus feature (to be described later) if it is in a winning combination. Thus, for example, the combination of "2-BAR," "CHANCE" and "2-BAR" is a standard winning combination which would pay the same as the combination of three "2-BAR" symbols, corresponding to the number of coins played and also is a start-bonus combination which starts the CHANCE bonus feature.

In one embodiment, if the player wagers 4 coins, and if three Rich Uncle Pennybags ("PENNY") symbols are displayed in scatter-pay format on reels 214, 216, 218, the game starts the ADVANCE TO BOARDWALK bonus feature (to be described later). In the scatter-pay format, the PENNY symbols are not required to be aligned with the center payline 276. Rather, the ADVANCE TO BOARDWALK bonus starts if reel 214 displays PENNY in either of the upper, center or lower display positions, reel 216 displays PENNY in either of the upper, center or lower display positions (which need not correspond to the display position of PENNY on reel 214) and reel 218 displays PENNY in either of the upper, center or lower display positions (which need not correspond to the display positions of PENNY on reels 214 or 216).

Table C-2 – ADVANCE TO BOARDWALK Pay Information

Pays	Pay/1Coin	Pay/2Coin	Pay/3Coi	Pay/4Coin	1-3 prob	4cn prob	1 cn EV	2 cn EV	3 cn EV	4cn EV	4th coin Pulls/Hit	Mx.Comr
non-win	0	0	0	0	0.83775	0.82928	0	0	0	0	1.205862	0
1 Wild	1	2	3	3	0.03284	0.03154	0.032841	0.032841	0.032841	0.023655	31.70642	0.025693
1 Cherry	2	4	6	6	0.04167	0.04167	0.083333	0.083333	0.083333	0.0625	24	0.067885
anybar	5	10	15	15	0.08496	0.08496	0.324797	0.324797	0.324794	0.243598	15.39421	0.284587
1 Bars	10	20	30	30	0.00904	0.00904	0.090422	0.090422	0.090422	0.067817	110.562	0.07386
anybar/Ch	16.75385	33.50769	50.26154	50.26154	0.00564	0.00564	0.094531	0.094531	0.070898	0.070898	177.2308	0.077007
2 Bars	20	40	60	60	0.00434	0.00434	0.086806	0.086806	0.086806	0.065104	230.4	0.070714
1 Bar/Ch	29.50385	59.00769	88.51154	88.51154	0.00181	0.00181	0.053356	0.053356	0.053356	0.040017	552.96	0.043465
3 Bars	40	80	120	120	0.00043	0.00043	0.017361	0.017361	0.017361	0.013021	2304	0.014143
2 Bar/Ch	55.00385	110.0077	165.0115	165.0115	0.00109	0.00109	0.059683	0.059683	0.059683	0.044762	921.6	0.048619
Sevens	70	140	210	210	7.2E-05	7.2E-05	0.005064	0.005064	0.005064	0.003798	13824	0.004125
3 Bar/Ch	106.0038	212.0077	318.0115	318.0115	0.00022	0.00022	0.023004	0.023004	0.023004	0.017253	4608	0.01874
Seven/Ch	182.5038	365.0077	547.5115	547.5115	7.2E-05	7.2E-05	0.013202	0.013202	0.013202	0.009901	13824	0.010755
7-Wild-7	200	400	1000	1000	7.2E-05	7.2E-05	0.014468	0.014468	0.024113	0.018084	13824	0.019643
			1st to 3rd coin totals:		Hit Rate		Coin 1 %	Coin 2 %	Coin 3 %		Pulls/Hit	
					0.16225		0.898869	0.898869	0.908514		6.163174	
Uncles	0	0	0	98.41212		0.00781				0.192211	128	0.208772
Surprise	0	0	0	98.41212		0.00195				0.048053	512	0.052193
			4th Coin totals:			Hit Rate				Coin 4 %	Pulls/Hit	
						0.17072				0.920673	5.857627	
				Pays4Coin		4cn prob					Pulls/Hit	
				2100+		1.3E-05					79701.54	

Table C-2 summarizes payoffs, probabilities and expected values associated with various combinations of the ADVANCE TO BOARDWALK™ game. The combinati ns are designated, in order f appearance: "non-win," "1 Wild," "1 Cherry," "anybar," "1 Bars," "anybar/Ch," "2 Bars," "1 Bar/Ch," "3 Bars," "2 Bar/Ch," "Sevens," "3 Bar/Ch," "Seven/Ch," "7-Wild-7," "Uncles" and "Surprise."

The "Pay/1 Coin," "Pay/2 Coin," "Pay/3 Coin" and "Pay/4 coin" columns identify payoff amounts associated with the respective combinations in Table C-2. In the case of the standard winning combinations, the payoff amounts are predetermined amounts stored in system memory. For example, the "1 Cherry" combination is a standard winning combination which will award 2 coins or credits in a 1-coin game, 4 coins or credits in a 2-coin game and 6 coins or credits in a 3- or 4-coin game.

In the case of the "start-bonus" combinations, the payoff amounts represent average payoff amounts which may be expected in the bonus game. For example, the "anybar/Ch" combination (i.e., a winning "anybar" combination with a CHANCE wildcard symbol) will start the CHANCE bonus and will pay, on average, 16.75 coins or credits in a 1-coin game, 33.5 coins or credits in a 2-coin game and 50.26 coins or credits in a 3- or 4-coin game. The "Uncles" and "Surprise" combinations represent combinations of RICH UNCLE PENNYBAGS ("PENNY") symbols and mystery blank symbols which trigger the ADVANCE TO BOARDWALK bonus. Both of these combinations are available only with 4 coins played and will pay, on average 98.4 coins or credits.

It should be noted that, using the arrangement of symbols of FIG. 17, the ADVANCE TO BOARWALK bonus game can actually be commenced by an arrangement of symbols with a WILD symbol on the center reel, which would otherwise constitute a winning base game combination. According to this embodiment, the base win is ignored, and the eventual bonus game win, which is guaranteed to be larger, is instead paid. For this reason, the 4 Coin "1 Wild" win in Table C-2 is less likely than in the 1-3 coin modes. However, embodiments are envisaged in which the base game win is combined with the bonus win when a bonus win occurs simultaneously with a base game win. The awards might for example be added or multiplied.

The "1-3 prob" column identifies the probabilities of hitting the various outcomes of Table C-2 associated with a 1-coin, 2-coin and 3-coin game in a single spin. The "4cn prob" column identifies the probabilities of hitting the various outcomes of Table C-2 associated with a 4-coin game in a single spin. Where the reels each have twenty-four reel stop positions, as in the ADVANCE TO BOARDWALK™ game, there are 13,824 (24 × 24 × 24) possible symbol combinations. The probability of hitting any particular combination in a single spin is determined by dividing the number of possible "hits" associated with that combination (which is a function of

the number of reel positions of the symbols supporting that combination) by the total number f possible combinations (*i.e.*, 13,824). For example, consider the "7-Wild-7" combination. Because there is only one SEVEN symbol on reel 214, one WILD symbol on reel 216 and one SEVEN symbol on reel 218, there is only one "hit" associated with that combinati n. The probability of hitting that combination is therefore 7.2×10^{-5} (*i.e.* $1 \div 13{,}824$). In a 4-coin game, the probability of hitting an "Uncles" combination is 0.00781 and the probability of hitting a "Surprise" combination is 0.00195.

The "1 cn EV," "2 cn EV," "3 cn EV" and "4 cn EV" columns identify the normalized expected values of the outcomes of Table C-2 for a 1-coin game, 2-coin game, 3-coin game and 4-coin game, respectively. These values are computed for each outcome by taking the product of the pay value (or average pay value) associated with that outcome and the probability associated with that outcome, then dividing by the number of coin(s) played. Thus, for example, the "Sevens" outcome has a 1-coin expected value of 0.005064 ($70 \times 7.2 \times 10^{-5} \div 1$), a 2-coin expected value of 0.005064 ($140 \times 7.2 \times 10^{-5} \div 2$), a 3-coin expected value of 0.005064 ($210 \times 7.2 \times 10^{-5} \div 3$) and a 4-coin expected value of 0.003798 ($210 \times 7.2 \times 10^{-5} \div 4$). The "Uncles" outcome has a 4-coin expected value of 0.192211 ($98.41212 \times 0.00781 \div 4$) and the "Surprise" outcome has a 4-coin expected value of 0.048053 ($98.41212 \times 0.00195 \div 4$).

The payout rate of the basic game is computed independently for a 1-coin, 2-coin, 3-coin and 4-coin game by summing the normalized expected values in the respective "1 cn EV," "2 cn EV," "3 cn EV" and "4 cn EV" columns. In the embodiment shown in Table C-2, the payout rates for a 1-coin and 2-coin game are 0.898869 (89.89%), the payout rate for a 3-coin game is 0.908514 (90.85%) and the payout rate for a 4-coin game is 0.920673 (92.07%).

The "4th coin Pulls/Hit" column indicates how many pulls, on average, would be expected to hit the respective combinations in a 4-coin game. This is computed by taking the inverse of the probability values associated with a 4-coin game.

The "Max Contribution" column indicates, for a 4-coin game, the percentage contribution of the respective "4 cn EV" values to the total payout rate for a 4-coin game. Thus, for example, for the "Uncles" outcome, the contribution is 20.88% ($0.192211 \div 0.920673$). The remaining "Max Contribution" values are computed in similar fashion.

The CHANCE Bonus Feature

In the MONOPOLY ADVANCE TO BOARDWALK™ game, if the "CHANCE" symbol is displayed on the payline and is included in a basic winning combination, the CHANCE bonus game begins. In one embodiment, there is only one "CHANCE" symbol on reel 216 (the center

reel) and, according to the game rules, it matches only SEVENs and BARs on the payline, thus the combinations which w uld trigger the CHANCE b nus are: SEVEN, CHANCE, SEVEN; 3 BAR, CHANCE, 3 BAR; 2 BAR, CHANCE, 2 BAR; 1 BAR, CHANCE, 1 BAR; and ANYBAR, CHANCE, ANYBAR.

The Chance bonus game can be activated by playing from one-four coins. In one embodiment, the CPU 270 sets up the CHANCE bonus game by first selecting, from a weighted table, one of several possible sets of selection elements. Generally, the sets of selection elements comprise a combination of multiplier values and/or fixed coin amounts. The magnitude of the respective multiplier values and/or fixed coin amounts are unique to each particular set of selection elements. The selection elements themselves may be varied according to the game program. In one embodiment, each set includes 10 selection elements but otherwise the numbers and/or values of multipliers and fixed coin awards may be varied from set to set. For example, one of the sets of selection elements might include 2X, 3X, 4X, 5X and 10X multipliers, and 2, 5, 10, 20, and 25 coin awards, whereas another set might include 2X, 3X, 4X, 5X and 10X multipliers and 5, 10, 25, 50 and 100 coin awards. Still another set might include 2X, 3X, 5X and 10X multipliers and 2, 5, 10, 25, 50 and 100 coin awards.

In one embodiment, as shown in FIG. 18, the CPU 270 causes the selected set of selection elements to be displayed on the graphics display 212 in roughly an oval shape around a center area where messages are displayed. In the illustrated embodiment, the message area prompts the player to "PRESS 'SPIN REELS' TO WIN THE CHANCE BONUS." From the display screen shown in FIG. 18, the CHANCE bonus is initiated by the player pressing the "Spin Reels" button or pulling a lever (not shown). The CPU 270 then operates according to its game program (stored in system memory 286) to randomly select one of the selection elements from the set. In one embodiment, the various selection elements have generally different probabilities of being selected, as determined by a table stored in system memory 286. In one embodiment having a set of selection elements including 2X, 3X, 4X, 5X and 10X multipliers and 2, 5, 10, 20 and 25 coin awards, the probabilities of selecting the respective selection elements are: 0.219231 for the 2X multiplier; 0.153846 for the 3X multiplier; 0.061538 for the 4X multiplier; 0.053846 for the 5X multiplier; 0.069231 for the 10X multiplier; 0.126923 for the 2 coin award; 0.138462 for the 5 coin award; 0.076923 for the 10 coin award; 0.042308 for the 20 coin award; and 0.057692 for the 25 coin award.

In one embodiment, the selection of the CHANCE bonus award element is depicted on the graphic display 212 by highlighting, one at a time, consecutive selection elements in a clockwise sequence, quickly at first and then slowing down and stopping to reveal the selected award

element, which might be a fixed coin amount or a multiplier. At this point, the message area will display the total amount of coins or credits won. For example, if the award from the basic game reels was 10 credits, and the highlight stopped on a 25 Coin am unt, the message area will contain "10 + 25 = 35 COINS". If, however, the award from the basic game reels was 10 credits, and the highlight stopped on a 4X multiplier, the message area will contain "1O X 4 = 40 COINS". The game would then total the amount won on the win meter and show a total screen on the display 112 announcing how many coins were won in the CHANCE bonus game. If the amount won is over the selected handpay level, a jackpot display and animation will then be shown on the display 112. In one embodiment, after the amount won is credited or payed out, the CHANCE bonus feature ends and the game returns to the basic game.

In one embodiment of a 4-coin game, the coin awards are multiplied by two for two coins bet and multiplied by three for three or four coins were bet. The fourth coin allows the player the opportunity to play the MONOPOLY ADVANCE TO BOARDWALK™ bonus game and does not increase the value of the CHANCE bonus.

The ADVANCE TO BOARDWALK™ Bonus Game

In one embodiment, the CPU 270 enters the ADVANCE TO BOARDWALK™ bonus game when the player is betting four coins and a special "start-bonus" combination of three RICH UNCLE PENNYBAGS ("PENNY") symbols occurs on the reels 214, 216, 218, in scatter-pay format, in the basic game. As described earlier, scatter-pay format means that the scatter pay symbols (e.g., "PENNY" symbols in the ADVANCE TO BOARDWALK™ game) may be displayed in either the upper, lower or center position on the respective reels.

The ADVANCE TO BOARDWALK™ bonus game has a board-game (e.g., MONOPOLY) theme and is implemented on the top box game board 262 and graphics display 212. Upon initially entering the bonus game, the CPU 70 causes an introductory animation to be displayed on the graphics display 212 with an audio fanfare and then signals I/O controller 271 to illuminate the GO square on the top box MONOPOLY board 262. The player is prompted to spin the reels to play the bonus game. Then, in one embodiment, the CPU 270 operates to select an integer-value movement indicator and causes the selected movement indicator to be displayed on the graphics display 212.

In one embodiment, the movement indicator is not immediately shown on the graphics display 212 but is revealed slowly so as to heighten the player's anticipation of the indicator. In one embodiment, the graphics display 212 shows the movement indicator on a display field which is intentionally fuzzy or cloudy at first, so as to "hide" the indicator but which is slowly cleared up

to reveal the selected indicator. In one embodiment of the MONOPOLY ADVANCE TO BOARDWALK™ game, for example, the graphics display shows an animation f a Rich Uncle Pennybags character seated at a desk-type "c ntrol panel." A message area on the control panel includes an animated computer or television-type monitor adapted to reveal the selected indicator. The monitor is filled with "static" at first so as to obscure the movement indicator. For example, the message area on the control panel might read, "YOU MOVE [blank] SPACES," where the blank is filled in by the number to be displayed on the monitor. After a short time, the Rich Uncle Pennybags character twiddles dials and levers on the control board to clear up the static and reveal the selected indicator. At this point, for example, the message area might read "YOU MOVE [7] SPACES," where the "7" is displayed on the animated monitor.

In one embodiment, the movement indicator (e.g., "7") identifies an amount of spaces, from two to twelve, which the token will be moved from its previous position on the game board, in much the same manner as would a roll of dice. In one embodiment, the CPU 270 selects the movement indicator pseudo-randomly, that is, certain indicator values might occur more frequently than other indicator values, depending on the space the player is presently "on." For example. the CPU 270 might be more likely to select a movement indicator of "7" if the player were on INDIANA AVENUE (thus landing the player on GO TO JAIL), than if the player were on ILLINOIS AVENUE. In one embodiment, a plurality of movement tables is stored in game memory, wherein each movement table corresponds to a particular square of the MONOPOLY board. The CPU 270 selects, from the movement table corresponding to present space, a movement indicator by first picking a random number, then consulting the movement table to determine the movement indicator corresponding to the random number.

In one embodiment, the movement tables define, for each square, a number of occurrences of each possible outcome from two to twelve. For example, one movement table might define a set of 46 possible occurrences, including 2 occurrences associated with a movement of 2 spaces, 2 occurrences associated with a movement of 3 spaces, 3 occurrences associated with a movement of 4 spaces, 5 occurrences associated with a movement of 5 spaces, 8 occurrences associated with a movement of 6 spaces, 6 occurrences associated with a movement of 7 spaces, 5 occurrences associated with a movement of 8 spaces, 7 occurrences associated with a movement of 9 spaces, 6 occurrences associated with a movement of 10 spaces, 1 occurrence associated with a movement of 11 spaces and 1 occurrence associated with a movement of 12 spaces.

The CPU 270 might select a movement indicator from the example table by selecting a random number from one to 46, then stepping through each occurrence until it finds the movement indicator corresponding to that random number. For example, for the example

m vement table above, a random number of 5 might indicate that the selected m vement indicator would be "4," since the first two "step throughs" are 2, the next two "step throughs" are 3 and the fifth step ends n an indicator f 4.

After the selection of a movement indicator number and display of the indicator on the graphics display 212, the CPU 270 operates to illuminate, one space at a time, the appropriate squares on the game board 262 (e.g., MONOPOLY board) from the previous position to the position determined by the movement indicator.

In one embodiment, when the lights stops moving for each roll, an animated character icon (e.g., Rich Uncle Pennybags) on the graphics display 212 announces the name of the square landed on and the amount of coins or credits, if any, associated with the square. Coins or credits are added to a total payout for the bonus game, which accumulates as the player moves from square to square. In one embodiment, the bonus game continues with consecutive selections of movement indicators, and corresponding movement around the game board, until the player "lands" on a designated square which ends the bonus game. In one embodiment, the CPU 270 will end the bonus game if the player lands on the IN JAIL, INCOME TAX or LUXURY TAX squares, otherwise will continue the bonus game.

If the player lands on an ELECTRIC COMPANY, WATER WORKS or FREE PARKING square during the bonus round, the CPU 270 selects a win amount from a plurality of possible win amounts associated with the square. In one embodiment, the CPU 270 triggers an appropriate animation on the graphics display 212 to illustrate the selection of a win amount. FIGs. 19, 20 and 21, show exemplary displays which might occur in response to the player landing on WATER WORKS, ELECTRIC COMPANY or FREE PARKING, respectively.

Generally, each of the WATER WORKS, ELECTRIC COMPANY and FREE PARKING displays show a pre-selected award value and a number of other, different values at various graphical locations. The display animation appears to "select" an award value, which has already been pre-selected by the CPU 270, by pointing to the pre-selected value or "erasing" the other values. In FIG. 19 (WATER WORKS), for example, there are four possible award values (e.g., 5, 10, 25 and 50) displayed at four graphical locations (e.g., underneath four pipes). An animated Rich Uncle Pennybags character turns a valve, causing water to come out of one of the pipes and "wash away" the underlying displayed value. He will do this three times, causing three of the award values to be "washed away," and the player will be awarded the remaining award value. In FIG. 20 (ELECTRIC COMPANY), there are four possible award values (e.g., 5, 20, 25 and 50) displayed on four light bulbs. An animated Rich Uncle Pennybags character presses a button, causing one of the light bulbs to light up then explode, so as to erase the award value associated

with the exploded bulb. As in FIG. 19, he will do this three times, causing three of the award values to be erased, and the player will be awarded the remaining award value. In FIG. 21 (FREE PARKING), there are seven possible award values (e.g., 10, 15, 20, 25, 50, 100 and 200) displayed on an animated parking meter. A pointer in the parking meter moves back and forth, then slowly comes to a stop so as to point to one of the award values, and the player is awarded the indicated award value.

In one embodiment, the indicated award values for the ELECTRIC COMPANY, WATER WORKS and FREE PARKING squares are pre-selected by the CPU 270 from weighted tables of award values stored in game memory. The CPU 270 selects, from the award table corresponding to the ELECTRIC COMPANY, WATER WORKS or FREE PARKING space, an award by first picking a random number, then consulting the appropriate award table to determine the award corresponding to the random number.

Suppose, for example, an ELECTRIC COMPANY square has five possible awards: 5, 10, 20, 25 or 50 coins. An award table associated with the ELECTRIC COMPANY square might define a set of eight possible occurrences of the various awards: 2 occurrences associated with an award of 5 coins, 2 occurrences associated with an award of 10 coins, 2 occurrences associated with an award of 20 coins, 1 occurrence associated with an award of 25 coins and 1 occurrence associated with an award of 50 coins. The CPU 270 might select an award from the award table by selecting a random number from one to 8, then stepping through each occurrence until it finds the award corresponding to that random number. Continuing the above example, a random number of 5 might indicate that the selected award would be 20 coins, since the first two "step throughs" are 5 coins, the next two "step throughs" are 10 coins and the next step ends on an award of 20 coins.

Similarly, suppose the FREE PARKING square has seven possible awards: 10, 15, 20, 25, 50, 100 and 200 coins. An award table associated with the FREE PARKING square might define a set of nine possible occurrences of the various awards: 1 occurrence associated with an award of 10 coins, 1 occurrence associated with an award of 15 coins, 2 occurrences associated with an award of 20 coins, 2 occurrences associated with an award of 25 coins, 1 occurrence associated with an award of 50 coins, 1 occurrence associated with an award of 100 coins and 1 occurrence associated with an award of 200 coins. The CPU 270 might select an award from the award table by selecting a random number from one to 9, then stepping through each occurrence until it finds the award corresponding to that random number. Continuing the above example, a random number of 5 might indicate that the selected award would be 25 coins, since the first "step

through" is 10 coins, the next "step through" is 15 coins, the next tw "step throughs" are 20 coins and the next step ends on an award of 25 coins.

If the player lands on CHANCE or COMMUNITY CHEST, the CPU 270 triggers an animati n n graphics display 212 which shows the top card of a pile of cars flipping up to reveal the "Chance" or "Community Chest" outcomes. The art on the cards resembles the cards in an actual MONOPOLY™ game. Generally, the "Chance" and "Community Chest" outcomes comprise awards of fixed coin values (e.g., "BANK PAYS YOU DIVIDEND OF 25 COINS), or move the player to a new space (e.g., ADVANCE TO NEAREST RAILROAD). If the player is moved to a property, the movement is indicated on the top box board 262 and an animation associated with the property is shown on the graphics display 212.

If the player draws a GO TO NEAREST UTILITY card, the light will move to either ELECTRIC COMPANY or WATER WORKS clockwise (whichever is nearest). In one embodiment, if movement to the nearest utility causes the player to pass GO, the player will be awarded a "passing GO bonus," in addition to the award, if any, associated with the nearest utility.

If the player draws a GO TO JAIL card, the game will play an animation of RICH UNCLE PENNYBAGS going to jail, and the light will quickly move counter-clockwise to the IN JAIL space. If the player stops on LUXURY TAX, INCOME TAX or IN JAIL, the display 212 will show an appropriate animation including a display of the total coins won in the bonus game. The CPU 270 will cause the payoff mechanism 288 to award coins or credits as appropriate, corresponding to the amount won in the bonus game and then return to the basic spinning reel game.

In one embodiment, a bonus is awarded whenever the player passes, or lands on, the GO square. As best observed in FIG. 16b, the bonuses are enumerated by a number of indicator lights 290 on the top box MONOPOLY board 262. In the illustrated embodiment, there are seven indicator lights associated with escalating 5, 10, 25, 100, 150, 500 and 1,500 coin bonuses. When the game begins, the player receives an automatic 5 coin bonus for being on GO and, accordingly, the 5 COIN indicator is lit on the board 262. If the player passes GO on his first cycle 1 around the board, the 10 COIN indicator will light, and the player will be awarded with 10 coins. If the player cycles around the board again, then the 25 COIN indicator will light, and the player will be awarded with 25 coins. If the player continues to pass GO a third, fourth, fifth and sixth time, the respective 100 COIN, 150 COIN, 500 COIN and 1500 COIN bonus indicators will become lit and the player will be awarded with 100 coins, 150 coins, 500 coins and 1500 coins respectively.

In one embodiment, the board may be cycled a maximum of six times. If a player successfully cycles the board six times, the bonus game will end and player will receive all

accumulated awards, plus the 1500 coin bonus, plus the award, if any, associated with the final space. If the final space causes the player to m ve to another square (e.g., GO TO NEAREST UTILITY), the player will be awarded the b nus, if any associated with that other square. F r example, suppose the player has completed five trips around the board and has accumulated 1754 coins or credits so far in the bonus game. Suppose further that the player is currently on PARK PLACE and Rich Uncle Pennybags selects a movement indicator of "5," causing the player to pass GO and land on the COMMUNITY CHEST square. The player will be awarded the 1500 coin bonus for passing GO the sixth time plus an amount associated with the COMMUNITY CHEST square. Continuing the example, suppose Rich Uncle Pennybags selects a COMMUNITY CHEST card of GO TO NEAREST UTILITY. The player will move to the next utility, ELECTRIC COMPANY, and will be awarded a selected value, say 25 coins. The bonus game will end after displaying, and then paying (in the present example), a win amount of 3279 coins (e.g., 1754 + 1500 + 25).

The expected payout of the bonus game must be calculated in order to calculate the overall payout of the machine. The simplest way of calculating the expected payout of the bonus game is to establish all the positions i which can be reached on the board. If the board forms a loop, as it does in this specific example, the same physical position on the board should be treated as a different position for the purposes of this analysis for each circuit of the board, even if the outcomes associated with that position are the same on each circuit of the board. That is to say, the looped board should be treated as if it were unraveled into one long trail, with the outcomes associated with the positions on the trail repeating cyclically. For example, the first position on the physical board after the start position cannot be reached on the first circuit of the board, as it is impossible to roll a value of 1 with two dice. However, it is possible to reach this position on the second circuit of the board. Furthermore, according to the specific example of the present invention, in which the number of circuits of the board is limited, it is impossible to reach any but the first 12 positions on the board after the last circuit of the board unless play is directed to one of the other positions by a special feature in a position that is reached. (Play would then stop once that position is reached). Expanding the board into a trail allows these differences to be taken into account.

The expected payout, not including the "passing go" bonuses, can be calculated simply as the sum of the product of the probability prob(i) of reaching each position i on the board and the expected payout pay(i) at that position, ie.

Last position

$$\sum_{i=\text{first position}} \text{prob}(i).\text{pay}(i)$$

The probability prob(i) of reaching a specific position i on the board is calculated as follows:

$$\text{Prob}(i) = \sum_{j=\text{first position}}^{\text{Last position}} \text{prob}(j).\text{probmove}(i,j)$$

The "passing go" bonuses are included in the calculation by multiplying each bonus by the probability of achieving that bonus to give an expected bonus value. These expected bonus values are then summed and added to the expected payout value already obtained to give the true expected payout. The probability of achieving a particular "go bonus" is calculated by first establishing every possible transitions from one square to another which will result in the respective "go bonus". For each of these transitions, the probability of being on the start square for that transition (already calculated) is multiplied by the probability of achieving that transition at that start square, to give a probability for that transition occurring during the game. These probabilities are then summed to give the probability of achieving that particular "go bonus".

It should be noted that if an outcome at a later position on the board can move play back to an earlier position, and play could then move from there to the later position again, this equation could become circular. That is to say, a value prob(i) could be dependent on a value prob(j) which might itself be dependent on prob(i). The fact that a position might be reached more than once cannot be taken into account by the above equation, and a precise calculation of the expected payout then becomes very complicated. However, the situation can easily be avoided by either not allowing backward moving outcomes, or guaranteeing that all backward moving outcomes result in a losing outcome, so that cycling backward and forward movement cannot occur. Allowing such cyclical movement is also dangerous because a software or hardware error could lead to unbounded cycling and a corresponding unbounded payout.

Once the expected payout of the bonus game has been calculated, the expected payout of the main game can be calculated by incorporating this value in the equations. In the present invention, the expected payout of the bonus game is 98.41.

As in the first embodiment, in practice, it is desirable to vary the payout percentages slightly. Accordingly, the bonus game may have any of the values probmove(i,j) varied slightly

to make it more or less likely to move t high scoring or low scoring positions, or the outcomes associated with each position could be varied. In practice, the latter is less practical, as the outcomes associated with most of the positions will often be physically marked on the surface of the board. However, the probabilities of the different outcomes when more than one outcome is possible can easily be changed.

The expected win for the bonus game is combined with the expected win of the base game to determine the expected value of the combined game.

From the foregoing, it will be understood that the second embodiment of the present invention provides a bonus game based on variable probability trials, in that a player who qualifies by playing the base game can play the bonus game on a "spin-til-you-lose" basis, with the probability of each allowable outcome of each trial being variable, and wherein the player is not in danger of losing awards scored in earlier trials when a losing outcome occurs, but instead accumulates winnings along the way. The bonus game according to this embodiment generally has a high hit rate, and as a result, the player has a strong inducement to "endure" the base game in order to qualify for bonus game play in which he is statistically likely to win several times in a row and collecting relatively large payouts, while still returning a profit for the game owner.

By providing a two stage gaming process in which a traditional game of chance is played as the base game, the existing concept with which players are familiar and comfortable is retained. At the same time, however, a significantly more exciting feature is added in the form of a bonus game.

For completeness, FIGS. 26 and 27 contain a flow diagram of the manner in which the base and bonus games of this embodiment are implemented in a processor based system. From these diagrams, those skilled in the art will be readily able to program the invention described herein.

The game selects symbols to display and establishes the outcome of the game and any bonus games in memory before commencing spinning the reels. The random values involved in the game outcome are stored for use when the outcome is actually displayed. In other embodiments, random values involved in the bonus game might be calculated after the reels have been spun, or just before they are used. The reels are spun and the chosen symbols are displayed (step 408). Before awarding credits to the player, in the event a winning combination appears on the payline, the program first checks to see if a CHANCE symbol appears on the payline (step 410). If it does, the program plays an animation on the dot matrix display, as

shown in step 412 and generates a random modification to the payout, either adding to it or multiplying it. If the game is in 4-coin mode, the program checks to see if a bonus symbol appears on each reel (Step 416) in the positions on, above or bel w the payline, or if SURPRISE symbols appear on the payline on each reel. If so, a bonus game has been earned and the program enters the bonus game (Step 418), as discussed below with reference to Fig. 27. The program then pays out the total pay, if any, in step 420, thus ending the play. As thus far described, with the exception of the CHANCE feature, this is the operation of a standard slot machine because the bonus feature has not been described. The player must continue playing the game as described until a BONUS symbol appears on each reel within the pay window or the SURPRISE symbol stops on the centerline on each reel to initiate operation of the bonus game.

When the bonus game occurs, the program, at Step 416, branches to the bonus game shown in Fig. 27. The start position on the backlit trail game board is lit up, and the winnings for the bonus game are set to an initial value of five. A random movement value between 2 and 12, M is obtained by the program, as shown in step 424 and an associated animation is shown on the dot matrix display to indicate the value M selected. The position indicator is moved M places. If the position reached is a losing position, a losing animation is shown in the dot matrix display, and the total winnings are transferred to the total pay to be either paid out or stored as credits. If the position is not a losing position, the program executes a routine associated with the position. This subroutine might be a variable outcome generating position, in which case a random value is generated to decide what the outcome associated with the position will be. The outcome will consist either of a "payout" or a "move". In the former case, the payout is added to the bonus game winnings, along with a suitable animation on the dot matrix display, and assuming the player has not completed the maximum number of allowable circuits of the board, the program loops back to generate another movement value M. If the player has traveled around the board the maximum number of times, the winnings are transferred to the total pay, as when the player lands on a losing position, and the bonus game ends. If the outcome is a "move" outcome, play is moved in a forward direction to the position indicated (unless the indicated position is a losing position in which case play can be moved backwards). Play then continues in the same way as if that position had been reached from step 426.

Now turning to FIG. 22, there is depicted another gaming machine 310 with a board game theme. In one embodiment, the gaming machine 310 is operable to play a game entitled MONOPOLY ROLL & WIN™, based on the MONOPOLY™ board game. MONOPOLY™ is a

registered trademark owned by and used with permission by Hasbro, Inc. and Hasbro International, Inc., Pawtucket, Rhode Island. Alternatively, the gaming machine 110 may be implemented with any of several other board game themes other than MONOPOLY™.

The gaming machine 310 includes a display window 370 through which a player may observe three mechanical reels, 314, 316 and 318. The gaming machine 310 includes a top box 332 which includes a graphics display 312, mechanical dice 364 and an adaptation of a game board 362 (e.g., MONOPOLY). The graphics display 312 may comprise a dot matrix, CRT, LED, LCD, electro-luminescent display or generally any type of video display known in the art. The game board 362 comprises a partially translucent material such as glass, plastic, Plexiglas or the like which is backlit by a number of lights 366 (not visible in FIG. 22) in the top box 332. As best observed in FIG. 24, the facing surface 360 of the top box is imprinted with various artwork, symbols and text associated with the MONOPOLY ROLL & WIN™ game, including a pay table 350.

FIG. 23 is a block diagram of a control system suitable for operating the slot machine 310 of FIG. 22. Coin/credit detector 382 signals a CPU 370 when a player has inserted a number of coins or played a number of credits. Then, after the player has activated a switch 384 (e.g., by pulling a lever or pushing a button), the CPU 370 initiates game play by setting reels 314, 316, 318 in motion, randomly selecting a game outcome and, using technology well known in the art, causes a reel motor and step controller 390 to stop the reels 314, 316, 318 at a stop position corresponding to the pre-selected game outcome. A rotational position detector 392 provides feedback to the CPU 370 to ensure that the reels 314, 316, 318 are stopped at the correct stop position. The symbols displayed on the reels at the preselected stop position define indicia of the pre-selected game outcome. In one embodiment, the symbols displayed on the reels define the basic game outcome.

A system memory 386 stores control software, operational instructions and data associated with the gaming machine 310. In one embodiment, the memory 386 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the memory 386 may be implemented on any of several alternative types of memory structures or may be implemented on a single memory structure. A payoff mechanism 388 is operable in response to instructions from the CPU 370 to award a payoff of coins or credits to the player in response to certain winning combinations stored in memory 386. As will be described in detail hereinafter, the payoff amounts corresponding to certain combinations is predetermined according to a pay table stored in system memory 386. A separate I/O controller

371 coupled to the CPU 370 operates the graphics display 312, mechanical dice 364 and top b x lights 366.

The gaming machine 310 is operable t play a basic game and a bonus game. In the embodiment of FIG. 22, the basic game is implemented on the three mechanical reels, 314, 316, 318 with a center payline 376. In one embodiment, the player can observe three symbol positions (e.g., an upper, center and lower display position) on each reel 314, 316, 318 thus defining a symbol group of nine symbols visible through the display window 370. Payline 376 extends through the center display position on each reel.

In one embodiment, the symbol group displayed on reels 314, 316, 318 may indicate any of three possible basic game outcomes, including (1) a standard winning outcome causing the CPU 370 to award the player a predetermined amount of coin(s) or credit(s) corresponding to a displayed pay table; (2) a multiplier bonus outcome (e.g., a ROLL THE DICE feature) causing the CPU 370 to award the player the product of a predetermined amount of coin(s) or credit(s) and a randomly determined multiplier; (3) a start-bonus outcome causing the CPU 370 to enter a bonus game (e.g., the ROLL & WIN bonus); and (4) a losing outcome causing the CPU 370 to continue operation in the basic mode without awarding any coin(s) or credit(s).

Generally, the standard winning outcomes are characterized by the display of one or more predefined combinations of symbols. The symbols and payoffs defining the standard winning combinations are stored in the game memory 386. In one embodiment, the symbols and payoffs defining the standard winning combinations are shown in the pay table 350 (FIG. 24) on the face of the slot machine 310 so that they may readily be observed by the player. Preferably, the symbols defining the ROLL THE DICE feature and ROLL & WIN bonus are also identified on the pay table or other portion(s) of the top box display 332.

FIG. 25 shows a set of reel strips for use with the slot machine 310 to implement the MONOPOLY ROLL & WIN™ game. The reel strips correspond to the reels 314, 316, 318 in FIG. 14 and will be identified by corresponding reference numerals 314, 316, 318. Each of the reel strips 314, 316, 318 include twenty-two symbols (including blanks) corresponding to twenty-two available reel stopping positions. The symbols include RICH UNCLE PENNYBAGS ("PENNY"), WILD, WILD DICE, SEVEN, 3-BAR, 2-BAR, 1-BAR, BLANK and CHERRY which, if displayed in certain predefined combinations relative to payline 376, define the standard and surprise winning combinations.

Specifically, the symbols which appear on reel strip 314 include, in sequence 1-BAR, Blank, PENNY, Blank, 2-BAR, Blank, PENNY, Blank, 1-BAR, Blank, PENNY, Blank, SEVEN, Blank, 2-BAR, Blank, 3-BAR, Blank, PENNY, Blank, 2-BAR and Blank. The symbols which appear on reel

strip 316 include, in sequence 2-BAR, Blank, WILD, Blank, PENNY, Blank, WILD DICE, Blank, PENNY, Blank, WILD, Blank, SEVEN, Blank, PENNY, Blank, 3-BAR, Blank, WILD, Blank, 1-BAR and Blank. Finally, the symbols which appear on reel strip 318 include, in sequence 2-BAR, Blank, CHERRY, Blank, 3-BAR, Blank, 1-BAR, Blank, PENNY, Blank, SEVEN, Blank, PENNY, Blank, CHERRY, Blank, PENNY, Blank, 1-BAR, Blank, CHERRY and Blank.

Table D-1 – Pay Table for ROLL & WIN™ Basic Game

Reel1	Reel2	Reel3	1Coin	2Coin	3Coin	4Coin
Seven	Seven	Seven	50	100	150	150
3Bar	3Bar	3Bar	40	80	120	120
2Bar	2Bar	2Bar	20	40	60	60
1Bar	1Bar	1Bar	10	20	30	30
AnyBar	AnyBar	Anybar	5	10	15	15
Anything	Wild	Cherry	5	10	15	15
Anything	Anything	Cherry	2	4	6	6

Table D-1 is a pay table identifying various standard winning combinations of symbols in the MONOPOLY ROLL & WIN™ game. In one embodiment, the game accepts from one to four coins. The winning standard combinations can occur for any number of one to four coins played if the indicated symbols are displayed on reels 314, 316, 318 in alignment with the center payline 376. For example, three "1-BAR" symbols displayed on reels 314, 316, 318 on the center payline 376 is a standard winning combination which will pay 10 credits for 1 coin played, 20 credits for 2 coins played and 30 credits for 3 or 4 coins played. The "AnyBar" combination is satisfied by any combination of three or more "1-BAR," "2-BAR" and "3-BAR" symbols stopping on the center payline 376.

In one embodiment, the "WILD" and "WILD DICE" symbols acts as wildcards for any other symbol on the payline 376. Where the "WILD" symbol is used to complete a winning combination, the payout will be the same as the standard winning combination as if completed without the WILD symbol. Thus, for example, the combination of "2-BAR," "WILD" and "2-BAR" is a standard winning combination which would pay the same as the combination of three "2-BAR" symbols, corresponding to the number of coins played. Where the "WILD DICE" symbol is used to complete a winning combination, the ROLL THE DICE FEATURE is triggered to identify a multiplier value, as heretofore described, and the multiplier value is used to multiply the amount otherwise associated with the combination.

The ROLL THE DICE Multiplier Feature

In the MONOPOLY ROLL & WIN™ game, if the "WILD DICE" symbol is displayed on the payline 376 and is included in a wining combination, the ROLL THE DICE multiplier feature begins. In one embodiment, there is only one "WILD DICE" symbol n reel 316 (the center reel) and the combinations which would trigger the ROLL THE DICE feature are: SEVEN, WILD DICE, SEVEN; 3 BAR, WILD DICE, 3 BAR; 2 BAR, WILD DICE, 2 BAR; 1 BAR, WILD DICE, 1 BAR; ANYBAR, WILD DICE, ANYBAR and PENNY, WILD DICE, PENNY. The PENNY, WILD DICE, PENNY combination also triggers the ROLL & WIN bonus game, to be described later.

The ROLL THE DICE feature can be activated by playing from one-four coins. When the WILD DICE symbol appears in a standard winning combination, the CPU 370 activates the ROLL THE DICE feature by randomly selecting a multiplier value, then multiplies the base amount associated with the standard winning combination by the selected multiplier value. When the WILD DICE symbol appears in the PENNY, WILD DICE, PENNY combination, a "start-bonus" combination which also triggers the ROLL & WIN bonus game, the CPU 370 enters the ROLL & WIN bonus game first and then, after the bonus game has ended, randomly selects a multiplier value and multiplies the amount won in the bonus game by the selected multiplier value.

In one embodiment, the CPU 370 selects the multiplier value by selecting a number corresponding to the roll of two six-sided dice. This is accomplished in one embodiment by randomly selecting two integer values from one to six (each corresponding to a roll of a single six-sided die), then summing the integer values to arrive at the multiplier value. Specifically, there are 36 possible outcomes of the two integer values which might occur: (1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (2,1), (2,2), (2,3), (2,4), (2,5), (2,6), (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), (4,1), (4,2), (4,3), (4,4), (4,5), (4,6), (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), (6,1), (6,2), (6,3), (6,4), (6,5) and (6,6). These outcomes correspond to 11 possible sums: 2 (1 occurrence), 3 (2 occurrences), 4 (3 occurrences), 5 (4 occurrences), 6 (5 occurrences), 7 (6 occurrences), 8 (5 occurrences), 9 (4 occurrences), 10 (3 occurrences), 11 (2 occurrences) and 12 (1 occurrence).

In one embodiment, each of the possible outcomes of integer values (corresponding to the roll of two dice) has an equal probability of occurrence and consequently, the probability of the CPU 370 selecting the various multiplier values (corresponding to the sum of two fair dice) is as follows: 2.7% (i.e., 1 ÷ 36) for the "2X" and "12X" multipliers; 5.5% (i.e., 2 ÷ 36) for the "3X" and "11X" multipliers; 8.3% (i.e., 3 ÷ 36) for the "4X" and "10X" multipliers; 11.1% (i.e., 4 ÷ 36) for the "5X" and "9X" multipliers; 13.9% (i.e., 5 ÷ 36) for the "6X" and "8X" multipliers; and 16.7% (i.e., 6 ÷ 36) for the "7X" multiplier.

In one embodiment, the selection of the ROLL THE DICE multiplier is depicted both graphically, n the graphic display 312 and mechanically, by the mechanical dice 364. On the graphics display 312, the CPU 370 generates a display of two dice which are rolling at first, then stop, one at a time to reveal two die faces. The die faces selected for display correspond to the integer values from one to six selected by the CPU 370. For example, having selected integer values of "1" and "6," the CPU 370 will display a pair of dice, one of which indicates a roll of "1" and the other indicating a roll of "6." The CPU 370 then adds the two integer values to determine the multiplier value (e.g., "7X") which in one embodiment is displayed adjacent to the two die faces on the graphics display 312. Similarly, the CPU 370 causes the two mechanical dice 364 to rotate or "roll" at first, then stop, one at a time to reveal two die faces. The die faces on the mechanical dice 364 correspond to the die faces on the graphics display 312.

Then, the CPU 370 then generates a screen on the graphics display 312 showing the total win. For example, suppose a "7X" multiplier is selected by the CPU 370 in a ROLL THE DICE feature which resulted from a SEVEN, WILD DICE, SEVEN symbol combination. In one embodiment, the graphics display shows the basic win amount associated with the SEVEN, WILD DICE, SEVEN symbol combination (e.g., 150 coins with 3 coins played), the selected multiplier (e.g., "7X") and the product of the multiplier and basic win amount (e.g., 1050 coins).

The ROLL & WIN™ Bonus Game

In one embodiment, the CPU 370 enters the ROLL & WIN™ bonus game when the player is betting four coins and a special "start-bonus" combination of three RICH UNCLE PENNYBAGS ("PENNY") symbols occurs on the center payline 376 of reels 314, 316, 318 in the basic game. The ROLL & WIN™ bonus game has a board-game (e.g., MONOPOLY) theme and is implemented on the top box game board 362 and graphics display 312. Upon initially entering the bonus game, the CPU 370 causes an introductory animation to be displayed on the graphics display 312 with a musical jingle and then operates to display an animation of a game token traveling around a MONOPOLY board. The CPU 370 also signals I/O controller 371 to illuminate the appropriate to illuminate a starting square on the top box game board 362 and then illuminate successive squares around the board in step-wise fashion, rapidly at first and then, after a couple of revolutions, slowing down and stopping on an indicated square. Generally, the indicated square is randomly determined by the CPU 370 prior to the illumination of successive squares on the top box game board 362.

In one embodiment, when the player "lands" on the indicated square, the graphics display 312 shows an animation for that square. As best observed in FIG. 24, the squares of the game

b ard 362 in one embodiment of the MONOPOLY ROLL & WIN game are: "GO," "BALTIC & MEDITTERANEAN AVENUE" (hereinafter "BALTIC"), "READING & PENNSYLVANIA & B. & O. & SHORT LINE RAILROAD" (hereinafter "RAILROAD"), "CONNECTICUT & VERMONT & ORIENTAL AVENUE" (hereinafter "VERMONT"), "IN JAIL," "VIRGINIA & STATES AVENUE & ST. CHARLES PLACE" (hereinafter "VIRGINIA"), "CHANCE," NEW YORK & TENNESSEE AVENUE & ST. JAMES PLACE" (hereinafter "NEW YORK"), "FREE PARKING," "KENTUCKY & INDIANA & ILLINOIS AVENUE" (hereinafter "ILLINOIS"), "UTILITIES," "MARVIN GARDENS & VENTNOR & ATLANTIC AVENUE" (hereinafter "MARVIN GARDENS"), "GO TO JAIL," "PENNSYLVANIA & NORTH CAROLINA & PACIFIC AVENUE" (hereinafter "PENNSYLVANIA"), "COMMUNITY CHEST" and "BOARD WALK & PARK PLACE" (hereinafter "BOARDWALK").

When the player lands on a square, the CPU 370 causes the player to be awarded the amount, if any, associated with the square. If the player is moved to a property, the movement is indicated on the top box board 362, an animation of the property is shown on the graphics display 312 and the player is awarded an amount, if any associated with the square. In one embodiment, the CPU 370 returns to the basic game after landing on a property square. If the game token 140 lands on a CHANCE or COMMUNITY CHEST square, the CPU 370 randomly selects an outcome from a plurality of possible CHANCE and COMMUNITY CHEST outcomes, and causes the graphics display 312 to display the selected outcome. If the CHANCE or COMMUNITY CHEST outcome is a fixed coin award, the graphics display 312 shows an animation of the award, the player is awarded the designated amount and then the CPU 370 returns to the basic game. If the player is moved to a new space as a result of a CHANCE or COMMUNITY CHEST outcome, the movement is indicated on the top box board 362, an animation of the square is shown on the graphics display 312, the player is awarded an amount, if any associated with the square and then the CPU 370 returns to the basic game.

Table D-2 – MONOPOLY ROLL & WIN Square Values

Pay	Occ	Prob	EV	Pulls/Hit	
200	480	0.037494142	7.49882831	26.670833	Go
20	480	0.037494142	0.74988283	26.670833	Baltic
150	640	0.049992189	7.49882831	20.003125	RailRoad
25	5[illegible]	0.037494142	0.93735354	26.670833	Vermont
0	1	7.81128E-05	0	12802	Jail
30	480	0.037494142	1.12482425	26.670833	Virginia
62.45	2080	0.162474613	10.1465396	6.1548077	Chance
40	960	0.074988283	2.99953132	13.335417	New York
100	1120	0.08748633	8.74863303	11.430357	Free parking
50	960	0.074988283	3.74941415	13.335417	Illinois
75	1120	0.08748633	6.56147477	11.430357	Utilities
100	1120	0.08748633	8.74863303	11.430357	Marvin Gardens
0	1	7.81128E-05	0	12802	Go to Jail
125	736	0.057491017	7.18637713	17.394022	Pennsylvania
62.4	2080	0.162474613	10.1384159	6.1548077	Comm Chest
1000	64	0.004999219	4.99921887	200.03125	Boardwalk
	12802	1	81.087955		

Table D-2 identifies various pay values, probabilities and expected values associated with the squares of the game board 362 in one embodiment of the MONOPOLY ROLL & WIN bonus game. The "Pay" column of Table D-2 identifies payoff amounts associated with the various squares. Other than the CHANCE and COMMUNITY CHEST squares, the payoff amounts are predetermined amounts stored in system memory. For example, the "GO" square will pay 200 coins or credits, the "BALTIC" square will pay 20 coins or credits, and so forth. In one embodiment, the IN JAIL and GO TO JAIL squares have zero value, consequently a player landing on those squares will not be paid any credits in the bonus game. In the case of the CHANCE and COMMUNITY CHEST squares, the payoff amounts represent average payoff amounts which may be expected by landing on CHANCE or COMMUNITY CHEST, respectively. In one embodiment, both the CHANCE and COMMUNITY CHEST squares will pay, on average 62.4 coins or credits in the bonus game.

Table D-3 – COMMUNITY CHEST Pay Information

Pay	Occ	Prob	EV	Pulls/Hit	
50	15	0.15	7.5	6.6666667	Opera
100	5	0.05	5	20	Inherit
45	15	0.15	6.75	6.6666667	Sell Stock
10	5	0.05	0.5	20	Beauty
200	4	0.04	8	25	Adv. Go
200	4	0.04	8	25	Bank Error
25	10	0.1	2.5	10	Services
20	12	0.12	2.4	8.3333333	Inc. Refund
100	5	0.05	5	20	Life Ins
100	10	0.1	10	10	Xmas Fund
45	15	0.15	6.75	6.6666667	Property Value
	100	1	62.4		

Table D-4 – CHANCE Pay Information

Pay	Occ	Prob	EV	Pulls/Hit	
15	24	0.08	1.2	12.5	Horse Race
10	22	0.073333333	0.73333333	13.636364	BlackJack
10	20	0.066666667	0.66666667	15	Dog Show
25	25	0.083333333	2.08333333	12	Slots
30	30	0.1	3	10	Adv St. Charles
150	17	0.056666667	8.5	17.647059	Adv. Rail
75	32	0.106666667	8	9.375	Adv. Util
50	33	0.11	5.5	9.0909091	Adv. ILL
50	35	0.116666667	5.83333333	8.5714286	Dividend
1000	2	0.006666667	6.66666667	150	Adv. Board
200	12	0.04	8	25	Adv. Go
40	32	0.106666667	4.26666667	9.375	Lottery
150	16	0.053333333	8	18.75	Loan
	300	1	62.45		

The various CHANCE and COMMUNITY CHEST outcomes, and their pay values, probabilities and expected values in one embodiment are identified in Tables D-3 and D-4, above. Generally, the CHANCE and COMMUNITY CHEST outcomes include awards of fixed coin values (e.g., "LIFE INSURANCE MATURES," $100) or instructions for movement to a particular square (e.g., ADVANCE TO BOARDWALK), where the indicated square is associated with a fixed coin award. As identified in Table D-3, the COMMUNITY CHEST outcomes range in value between 10 coins or credits (e.g., "BEAUTY CONTEST", 10 coins) to a maximum of 200 coins or credits (e.g., ADVANCE TO GO, and BANK ERROR IN YOUR FAVOR). The average value of the COMMUNITY CHEST square is 62.4 coins or credits. As identified in Table D-4, the CHANCE outcomes range in value between 10 coins or credits (e.g., "DOG

SHOW", 10 coins) to a maximum of 1000 coins or credits (e.g., ADVANCE TO BOARDWALK).

In one embodiment, the likelihood f landing on a particular square is predefined and stored in an occurrence probability table in game memory. The CPU 370 selects a particular square in a manner which is consistent with the occurrence probability table. Generally, the occurrence probability table might cause certain squares to be landed on more frequently than other squares. In Table D-2, the "Occ" column identifies a predefined number of outcomes or "occurrences" of each square of the MONOPOLY ROLL & WIN game board, and the "Prob" column identifies the probability of selecting or "landing" on the respective squares. An inspection of Table D-2 reveals that there is only 1 outcome, out of 12,802 possible outcomes, which will result in the player landing on the IN JAIL square. Similarly, there is only 1 outcome, out of 12,802 possible outcomes, which will result in the player landing on the GO TO JAIL square. Thus, the probability of the player landing on IN JAIL or GO TO JAIL (and thereby getting no award) is very small, 7.811×10^{-5} (i.e., $1 \div 12{,}802$). The probability of landing on the other squares is generally much greater and also corresponds to the predefined number of outcomes or "occurrences" associated with the squares. For example, consider the "GO" square. The "Occ" column of Table D-1 indicates that there are 480 outcomes, out of 12,802 possible outcomes, which will result in the player landing on the GO square. Thus, the probability of the player landing on the GO square (and thereby getting an award of 200 coins or credits) is 0.037494 (i.e., $480 \div 12{,}802$). The probability of landing on other squares is computed from the "Occ" column in similar fashion.

Similarly, in one embodiment, the likelihood of selecting certain CHANCE or COMMUNITY CHEST cards is predefined and stored in an occurrence probability table in game memory. The CPU 370 selects a particular CHANCE or COMMUNITY CHEST card in a manner which is consistent with the occurrence probability table. Generally, the occurrence probability table might cause certain cards to be "drawn" more frequently than other cards. In Tables D-3 and D-4, respectively, the "Occ" column identifies a predefined number of outcomes or "occurrences" which might occur as a result of landing on CHANCE and COMMUNITY CHEST on the MONOPOLY ROLL & WIN game board. The "Prob" column identifies the probability of selecting or "drawing" the respective CHANCE and COMMUNITY CHEST outcomes. The various probabilities of the CHANCE and COMMUNITY CHEST outcomes are computed by dividing the number of occurrences of the particular outcome by the total number of CHANCE or COMMUNITY CHEST outcomes, as appropriate. For example, consider the "ADVANCE TO GO" outcome in COMMUNITY CHEST. Table D-3 shows that there are 4 outcomes, out of 100 possible COMMUNITY CHEST outcomes, which will result in drawing the "ADVANCE TO GO"

card. Thus, having landed on the COMMUNITY CHEST square, the probability of the player drawing the "ADVANCE TO GO" card (and thereby getting an award of 200 coins or credits) is 0.04 (i.e., 4 ÷ 100). Next consider the "ADVANCE TO GO" outcome in CHANCE. Table D-4 shows that there are 12 outcomes, out of 300 possible CHANCE outcomes, which will result in drawing the "ADVANCE TO GO" card. Thus, having landed on the CHANCE square, the probability of the player drawing the "ADVANCE TO GO" card (and thereby getting an award of 200 coins or credits) is 0.04 (i.e., 12 ÷ 300). The probability of drawing other cards is computed in similar fashion.

The "EV" column identifies the expected values associated with the various squares (Table D-2), COMMUNITY CHEST cards (Table D-3) or CHANCE cards (Table D-4). These values are computed for each outcome by taking the product of the pay value (or average pay value) associated with that outcome and the probability associated with that outcome. Thus, for example, the "GO" square has an expected value of 7.49882831 (i.e., 200 × 0.037494142), and the "ADVANCE TO GO" card (in both CHANCE and COMMUNITY CHEST) has an expected value of 8 (i.e., 200 × 0.04).

The "Pulls/Hit" value represents the number of times, on average, that the game must be played before landing on the particular square (Table D-2) or drawing the particular CHANCE or COMMUNITY CHEST cards (Tables D-3 and D-4). The "Pulls/Hit" column is simply the inverse of the "Prob" values in Tables D-2, D-2 and D-4. Thus, for example, the "GO" square has a "Pulls/Hit" value of 26.67 (i.e., 1 ÷ 0.037494142), and the "ADVANCE TO GO" card (in both CHANCE and COMMUNITY CHEST) has a "Pulls/Hit" value of 25 (i.e., 1 ÷ 0.04).

Table D-5 – ROLL & WIN Pay Information

Pay	Mult	Comb	Prob	EV	4thCoin	Pulls/Hit	MaxEval
600	12	7Roll7	2.6087E-06	0.0015652	0.00117393	383328	0.127201
550	11	7Roll7	5.2175E-06	0.0028696	0.0021522	191664	0.233203
500	10	7Roll7	7.8262E-06	0.0039131	0.00293482	127776	0.318004
450	9	7Roll7	1.0435E-05	0.0046957	0.00352179	95832	0.381604
400	8	7Roll7	1.3044E-05	0.0052175	0.0039131	76666.6	0.424005
350	7	7Roll7	1.5652E-05	0.0054783	0.00410875	63888	0.445205
300	6	7Roll7	1.3044E-05	0.0039131	0.00293482	76665.6	0.318004
250	5	7Roll7	1.0435E-05	0.0026087	0.00195655	95832	0.212002
200	4	7Roll7	7.8262E-06	0.0015652	0.00117393	127776	0.127201
150	3	7Roll7	5.2175E-06	0.0007826	0.00058696	191664	0.063601
100	2	7Roll7	2.6087E-06	0.0002609	0.00019565	383328	0.0212
50		777	0.00037566	0.0187829	0.01408715	2662	1.526418
480	12	3BRoll3B	2.6087E-06	0.0012522	0.00093914	383328	0.101761
440	11	3BRoll3B	5.2175E-06	0.0022957	0.00172178	191664	0.186562
400	10	3BRoll3B	7.8262E-06	0.0031305	0.00234786	127776	0.254403
360	9	3BRoll3B	1.0435E-05	0.0037566	0.00281743	95832	0.305284
320	8	3BRoll3B	1.3044E-05	0.004174	0.00313048	76665.6	0.339204
280	7	3BRoll3B	1.5652E-05	0.0043827	0.003287	63888	0.356164
240	6	3BRoll3B	1.3044E-05	0.0031305	0.00234786	76665.6	0.254403
200	5	3BRoll3B	1.0435E-05	0.002087	0.00156524	95832	0.169602
160	4	3BRoll3B	7.8262E-06	0.0012522	0.00093914	127776	0.101761
120	3	3BRoll3B	5.2175E-06	0.0006261	0.00046957	191664	0.050881

80	2	3BRoll3B	2.6087E-06	0.0002087	0.00015652	383328	0.01696
40		3B3B3B	0.00037566	0.0150263	0.01126972	2662	1.221134
240	12	2BRoll2B	7.8262E-06	0.0018783	0.00140872	12776	0.152642
220	11	2BRoll2B	1.5652E-05	0.0034435	0.00258264	63888	0.279843
200	10	2BRoll2B	2.3479E-05	0.0046957	0.00352179	42592	0.381604
180	9	2BRoll2B	3.1305E-05	0.0056349	0.00422615	31944	0.457925
160	8	2BRoll2B	3.9131E-05	0.006261	0.00469572	25555.2	0.508806
140	7	2BRoll2B	4.6957E-05	0.006574	0.0049305	21296	0.534246
120	6	2BRoll2B	3.9131E-05	0.0046957	0.00352179	25555.2	0.381604
100	5	2BRoll2B	3.1305E-05	0.00031305	0.00234786	31944	0.254403
80	4	2BRoll2B	2.3479E-05	0.0018783	0.00140872	42592	0.152642
60	3	2BRoll2B	1.5652E-05	0.0009391	0.00070436	63888	0.076321
40	2	2BRoll2B	7.8262E-06	0.000313	0.00023479	127776	0.02544
20		2B2B2B	0.00112697	0.0225394	0.01690458	887.3333333	1.831701
120	12	1BRoll1B	1.0435E-05	0.0012522	0.00093914	95832	0.101761
110	11	1BRoll1B	2.087E-05	0.0022957	0.00172176	47916	0.186562
100	10	1BRoll1B	3.1305E-05	0.0031305	0.00234786	31944	0.254403
90	9	1BRoll1B	4.174E-05	0.0037566	0.00281743	23958	0.305284
80	8	1BRoll1B	5.2175E-05	0.004174	0.00313048	19166.4	0.339204
70	7	1BRoll1B	6.261E-05	0.0043827	0.003287	15972	0.356164
60	6	1BRoll1B	5.2175E-05	0.0031305	0.00234786	19166.4	0.254403
50	5	1BRoll1B	4.174E-05	0.002087	0.00156524	23958	0.169602
40	4	1BRoll1B	3.1305E-05	0.0012522	0.00093914	31944	0.101761
30	3	1BRoll1B	2.087E-05	0.0006261	0.00046957	47916	0.050881
20	2	1BRoll1B	1.0435E-05	0.0002087	0.00015652	95832	0.01696
10		1B1B1B	0.00150263	0.0150263	0.01126972	665.5	1.221134
60	12	ABRollAB	4.174E-05	0.0025044	0.00187829	23958	0.203522
55	11	ABRollAB	8.3479E-05	0.0045914	0.00344353	11979	0.373124
50	10	ABRollAB	0.00012522	0.006261	0.00469572	7986	0.508806
45	9	ABRollAB	0.00016696	0.0075131	0.00563486	5989.5	0.610567
40	8	ABRollAB	0.0002087	0.0083479	0.00626096	4791.6	0.678408
35	7	ABRollAB	0.00025044	0.0087653	0.006574	3993	0.712328
30	6	ABRollAB	0.0002087	0.006261	0.00469572	4791.6	0.508806
25	5	ABRollAB	0.00016696	0.004174	0.00313048	5989.5	0.339204
20	4	ABRollAB	0.00012522	0.0025044	0.00187829	7986	0.203522
15	3	ABRollAB	8.3479E-05	0.0012522	0.00093914	11979	0.101761
10	2	ABRollAB	4.174E-05	0.0004174	0.00031305	23958	0.03392
5		ABABAB	0.01051841	0.052592	0.03944403	95.07142857	4.273969
60	12	AmyRollCherry	0.00017218	0.0103306	0.00774793	5808	0.83953
55	11	AmyRollCherry	0.00034435	0.0189394	0.01420455	2904	1.539138
50	10	AmyRollCherry	0.00051653	0.0258264	0.01936983	1936	2.098824
45	9	AmyRollCherry	0.00068871	0.0309917	0.0232438	1452	2.518589
40	8	AmyRollCherry	0.00086088	0.0344353	0.02582645	1161.6	2.798432
35	7	AmyRollCherry	0.00103306	0.036157	0.02711777	968	2.938354
30	6	AmyRollCherry	0.00086088	0.0258264	0.01936983	1161.6	2.098824
25	5	AmyRollCherry	0.00068871	0.0172176	0.01291322	1452	1.399216
20	4	AmyRollCherry	0.00051653	0.0103306	0.00774793	1936	0.83953
15	3	AmyRollCherry	0.00034435	0.0051653	0.00387397	2904	0.419765
10	2	AmyRollCherry	0.00017218	0.0017218	0.00129132	5808	0.139922
5		2Cherry	0.01859504	0.0929752	0.0697314	53.77777778	7.555767
2		Cherry	0.11157025	0.2231405	0.16735537	8.962962963	18.13384
Base Game Totals			**0.1526108**	**0.834523**	**0.625892**		
973.0555	12	UncleRollUncle	3.1305E-05		0.00761532	31944	
891.9675	11	UncleRollUncle	6.261E-05		0.01396142	15972	
810.8796	10	UncleRollUncle	9.3914E-05		0.01903831	10648	
729.7916	9	UncleRollUncle	0.00012522		0.02284597	7986	
648.7036	8	UncleRollUncle	0.00015652		0.02538441	6388.8	
567.6157	7	UncleRollUncle	0.00018783		0.02665363	5324	
486.5277	6	UncleRollUncle	0.00015652		0.01903831	6388.8	
405.4398	5	UncleRollUncle	0.00012522		0.0126922	7986	
324.3518	4	UncleRollUncle	9.3914E-05		0.00761532	10648	
243.2639	3	UncleRollUncle	6.261E-05		0.00380766	15972	
162.1759	2	UncleRollUncle	3.1305E-05		0.00126922	31944	
			0.00112697				
81.08796		UncleUncleUncle	0.00676183		0.13707581	147.8888889	
Board Game Totals			**0.0078888**		**0.296998**	**126.7619048**	
Base and Bonus Games			**0.1604996**		**0.92289**		
Probability of Top Award (BoardWalk w/ dice roll of 12) =					**1.9041E-07**	**5251888.973**	**pulls**

Table D-5 identifies vari us symbol combinations, probabilities and expected values associated with the ROLL & WIN game according to one embodiment of the present invention. The combinations include various standard winning combinations including "777," "3B3B3B," "2B2B2B," "1B1B1B," "ABABAB," "2 Cherry" and "Cherry;" various combinations which will start the ROLL & WIN bonus game including "UncleUncleUncle;" and various combinations which will trigger the ROLL THE DICE multiplier feature, including "7Roll7," "3BRoll3B," "2BRoll2B," "1BRoll1B," "ABRollAB" and "AnyRollCherry" and "UncleRollUncle." In Table D-5 and the description to follow, "Roll" is a shorthand notation for the WILD DICE symbol, "3B," "2B," "1B" and "AB" are shorthand notations for the 3 BAR, 2 BAR, 1 BAR and ANY BAR symbols and "Uncle" is a shorthand notation for the RICH UNCLE PENNYBAGS symbol.

The "Pay" column identifies payoff amounts associated with the respective combinations in Table D-5, for 1 coin played. In the case of the standard winning combinations, the payoff amounts are predetermined amounts stored in system memory. For example, the "777" combination is a standard winning combination which will award 50 coins or credits in a 1-coin game. In one embodiment, the coin awards are multiplied by two for two coins bet and multiplied by three for three or four coins bet. The fourth coin allows the player the opportunity to play the MONOPOLY ROLL & WIN™ bonus game and does not increase the value of the standard winning combinations above the 3-coin payoff amount. Thus, for example, the "777" combination which, as noted above, will award 50 coins or credits in a 1-coin game, will award 100 coins or credits in a 2-coin game and 150 coins or credits in a 3- or 4-coin game.

In the case of the combinations starting the ROLL & WIN bonus game, the payoff amounts represent average payoff amounts which may be expected in the bonus game. For example, the "UncleUncleUncle" combination will start the ROLL & WIN bonus game (if 4 coins or credits are played) which will pay, on average, 81.08796 coins or credits.

In the case of the combinations including a "Roll" (WILD DICE) symbol, the payoff amounts represent the product of the standard payoff (or average bonus payoff) with various multiplier values 2 to 12 which might result from the ROLL THE DICE multiplier-bonus. For example, "2 7Roll7" is a shorthand notation for the 7, WILD DICE, 7 combination which triggers the ROLL THE DICE feature, and in which a multiplier bonus of "2" is selected in the ROLL THE DICE feature. The payoff amount for the "2 7Roll7" combination is 100, or twice the payoff of the "777" combination. Similarly, "3 7Roll7" is a shorthand notation for the 7, WILD DICE, 7 combination in which a multiplier bonus of "3" is selected in the ROLL THE DICE feature to triple the payoff of the "777" combination, and so forth.

With the exception of the "UncleRollUncle" combination, which is only available for 4 coins played, the various combinations including a "Roll" (WILD DICE) symbol are multiplied by two for two coins bet and multiplied by three for three or four coins bet. The fourth coin allows the player the opportunity to play the MONOPOLY ROLL & WIN™ bonus game and does not increase the value of the standard winning combinations above the 3-coin payoff amount. Thus, for example, the "2 7Roll7" combination which, as noted above, will award 100 coins or credits in a 1-coin game, will award 200 coins or credits in a 2-coin game and 300 coins or credits in a 3- or 4-coin game.

The "Prob" column identifies, for the standard winning combinations, the probabilities of hitting the outcomes in a single spin. For the combinations including a WILD DICE ("Roll") symbol, the "Prob" value takes into account the probability of rolling the indicated multiplier as well as the probability of "hitting" the indicated outcome. Where the reels each have twenty-two reel stop positions, as in the ROLL & WIN™ game, there are 10,648 (22 × 22 × 22) possible symbol combinations. The probability of hitting any particular combination in a single spin is determined by dividing the number of possible "hits" associated with that combination (which is a function of the number of reel positions of the symbols supporting that combination) by the total number of possible combinations (*i.e.*, 10,648). For example, consider the "777" combination. Because there is one SEVEN symbol on reel 314, one SEVEN symbol on reel 316 and one SEVEN symbol on reel 318, there is one "hit" associated with that combination. The probability of hitting that combination is therefore 9.39×10^{-5} (*i.e.* 1 ÷ 10,648).

Next consider the various "7Roll7" combinations. If the ROLL THE DICE multiplier is determined according to the roll of a pair of fair dice, the probability of selecting a "2X" or "12X" multiplier is 2.7%, the probability of selecting a "3X" or "11X" multiplier is 5.5%, the probability of selecting a "4X" or "10X" multiplier is 8.3%, the probability of selecting a "5X" or "9X" multiplier is 11.1%, the probability of selecting a "6X" or "8X" multiplier is 13.9% and the probability of selecting a "7X" multiplier is 16.7%. The probability of "hitting" the "2 7Roll7" and "12 7Roll7" combinations is therefore 2.53×10^{-6} (*i.e.* $9.39 \times 10^{-5} \times 0.027$). The remaining probabilities are computed in similar fashion.

The "EV" column identifies the normalized expected values of the various standard winning outcomes of Table D-2 for a 1-coin, 2-coin or 3-coin game. These values are computed for each outcome by taking the product of the pay value (or average pay value) associated with that outcome and the probability associated with that outcome, divided by the number of coins played. Thus, for example, the "12 7Roll7" outcome has a 1-coin expected value of 0.0015652

(600 x 2.6087 × 10^{-6} ÷ 1), a 2-coin expected value of 0.0015652 (1200 x 2.6087 × 10^{-6} ÷ 2) and a 3-coin expected value of 0.0015652 (1800 x 2.6087 × 10^{-6} ÷ 3).

The "4thCoin" column identifies the normalized expected values of the vari us standard winning outcomes of Table D-2 for a 4-coin game. These values are computed in similar fashion as the 1-coin, 2-coin and 3-coin expected values but differ because the pay value of the standard combinations does not increase from a 3-coin to a 4-coin game. Thus, for example, the "12 7Roll7" outcome has a 4-coin expected value of 0.00117393 (1800 x 2.6087 × 10^{-6} ÷ 4).

Any of the gaming machines heretofore described can be implemented with bonus-resource outcomes, causing the processor to generate a deferred instruction which is exercisable to enhance the excitement and/or winning expectation in the bonus game. Generally, the deferred instruction associated with the bonus resource is exercisable in response to later outcomes or events in the game. For example, the bonus resource might be obtained in response to special symbol combination(s) the basic game and the deferred instruction associated with the bonus resource might be exercised in the bonus game. The deferred instruction might be executed automatically by the CPU in response to certain later-displayed indicia in the game or might be exercisable in response to player input. In one embodiment, the CPU continues to operate in the basic mode after the occurrence of a bonus-resource outcome in the basic game. In this embodiment, any number of bonus-resource outcomes may occur through several repetitions of the basic game (causing the CPU to store a corresponding number of deferred instructions in game memory) before entering the bonus mode. In one embodiment, the CPU exercises the deferred instruction(s) associated with the bonus-resource(s), if at all, in the bonus game.

In one embodiment, the bonus game resource comprises a multiplier (e.g., 2X, 5X, 10X, etc.) associated with a deferred instruction to multiply a later displayed value, such as an amount of coin(s) or credit(s) otherwise awarded in a bonus game. For example, a "5X" resource, obtained as a result of a particular outcome of the basic game, might be exercised in the bonus game to instruct the CPU to multiply an otherwise-indicated award of 5 coins by five, resulting in an award of 25 coins. In another embodiment, the deferred instruction associated with the bonus game resource comprises an "override" command causing the CPU to override or block the performance of an instruction otherwise indicated in the bonus game. For example, a deferred "override" command, obtained in the basic game as a result of a particular bonus-resource outcome, might be played in the bonus game to override an "end-bonus" instruction encountered in the bonus game. Whereas the "end-bonus" instruction would otherwise have caused the CPU to end the bonus game, the exercise of the "override" command would allow the player to continue the bonus game. With particular reference to the MONOPOLY-theme games described herein,

one bonus-resource might comprise a "GET OUT OF JAIL FREE" card, obtainable as a result of a special symbol combination in the basic game and associated with a deferred instruction to "get out of jail," or in other words to override the instruction nominally associated with the IN JAIL square. Thus, for example, if the IN JAIL square is nominally associated with an "end-bonus" instruction, causing the CPU to end the bonus game, a player landing on the IN JAIL square might exercise a "GET OUT OF JAIL FREE" card to override the nominal end-bonus instruction and continue the bonus game.

It will be appreciated that the present invention has generally been described with reference to the particular games ADVANCE TO BOARDWALK™, REEL ESTATE™, ONCE AROUND™ and ROLL & WIN™, based on the MONOPOLY™ board game but is not limited to these particular games. For example, while the aforementioned games have a basic game in the form of a slot machine, the present invention may be implemented with virtually any type of game of chance or skill or combination of such games having outcomes (e.g., "start-bonus" outcomes) which may trigger play of a bonus game. The basic game may comprise, for example, a video poker or video blackjack game. Moreover, the present invention may be based on board games other than MONOPOLY. Other variations within the scope of the present invention include basic games or bonus games with different numbers and types of reels and/or symbols, different payline configurations, different values of coin awards, different probabilities, payback percentages, etc.

While the present invention has been described with reference to one or more particular embodiments, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present invention. Each of these embodiments and obvious variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.

WHAT IS CLAIMED IS:

1. A method of operating a gaming machine under control of a processor, the method comprising the steps of:

executing, under control of the processor, a game program defining a plurality of stations about a game board traversable by a game token;

selecting, under control of the processor in response to player input, a game token for illustrating movement between said stations; and

displaying, under control of the processor, the selected game token at one or more stations on the game board determined by execution of the game program.

2. The method of claim 1 wherein the step of selecting a game token includes the steps of:

displaying a selection screen showing a plurality of token selection options; and

selecting, under player control, a game token from among the token selection options.

3. The method of claim 2 wherein the selection screen comprises a touch-screen display and the selecting step comprises the touching the touch screen over one of the token selection options.

4. The method of any of claims 1 to 3 wherein the processor is operable in a basic mode and a bonus mode, the executing step being accomplished in the bonus mode.

5. A gaming machine comprising:

a processor operable to execute a game program defining a plurality of stations about a game board traversable by a game token;

a selection element for selecting, in response to player input, a game token for illustrating movement between said stations; and

a display for displaying, under control of the processor, the selected game token at one or more stations on the game board determined by execution of the game program.

6. A method of operating a gaming machine under control of a processor, the processor being perable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the method comprising:

selecting, in response to player input, a predicted position of the token identifier to be determined by execution of the game program, the predicted position corresponding to one of the stations on the game board;

executing, under processor control, the game program to determine a true position of the token identifier;

comparing, under control of the processor, the predicted position of the token identifier to the true position of the token identifier; and

awarding a payoff to the player if the predicted position corresponds to the true position.

7. The method of claim 6 wherein the selecting step is performable a plurality of times to select a plurality of predicted positions of the token identifier prior to executing the game program, the processor comparing each of the predicted positions of the token identifier to the true position of the token identifier and awarding a payoff to the player if any of the predicted positions corresponds to the true position.

8. The method of either of claims 6 or 7 wherein the step of selecting a predicted position includes the steps of:

displaying a selection screen showing a plurality of position selection options; and

selecting, under player control, a predicted position from among the plurality of position selection options.

9. The method of claim 8 wherein the selection screen comprises a touch-screen display and the selecting step comprises the touching the touch screen over a selected position selection option.

10. The method of claim 6 wherein the processor is operable in a basic mode and a bonus mode, the executing step being accomplished in the bonus mode.

11. The method of claim 6 wherein the step of executing the game program comprises:

identifying, under control of the processor, a first position of the token identifier on the game board;

selecting, under control of the processor, an integer movement value from among a plurality of integer movement values;

moving the token identifier a number of steps on the game board from the first position, the number of steps corresponding to the selected integer movement value; and

identifying, under control of the processor, a second position of the token identifier on the game board resulting from the moving step, the second position defining the true position of the token identifier.

12. The method of claim 11 further comprising the step of defining a target integer movement value, the step of awarding a payoff to the player comprising awarding a bonus payoff to the player if the selected integer movement value matches the target integer movement value.

13. The method of claim 11 wherein the step of selecting an integer movement value comprises:

selecting a first integer value corresponding with one of the faces of a first die;

selecting a second integer value corresponding with one of the faces of a second die; and

summing the first and second integer values to define a selected integer movement value.

14. A gaming machine comprising:

a processor operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier;

means for identifying, under control of the processor, a first position of the token identifier comprising one of the stations on the game board;

means for selecting, under control of the processor in response to player input, a predicted position of the game token to be determined by execution of the game program, the predicted position corresponding to one of the stations on the game board;

means for executing, under processor control, the game program to determine a second position of the token identifier;

means for comparing, under control of the processor, the predicted position to the second position; and

means for awarding a payoff to the player if the predicted position corresponds to the second position.

15. A gaming machine comprising:

a processor for controlling a game of chance in a basic mode and a bonus mode, the processor being operable in the basic mode to select one or more basic game outcomes and in the bonus mode to select one or more bonus game outcomes;

at least one display for displaying respective indicia of the selected outcomes;

means associated with the processor for issuing game control instructions associated with the respective indicia, the game control instructions including a plurality of nominal executable instructions adapted for execution by the processor upon display of the respective indicia and at least one deferred executable instruction adapted for deferred execution by the processor.

16. The gaming machine of claim 15 wherein said at least one deferred executable instruction includes an override command executable by the processor in response to later displayed indicia.

17. The gaming machine of claims 16 wherein the override command is executable to override a nominal executable instruction associated with the later-displayed indicia.

18. The gaming machine of any of claims 15 to 17 wherein one of said at least one deferred executable instructions is issued by the means for issuing in response to one of the basic game outcomes and is executable by the processor in the bonus game.

19. The gaming machine of claim 18 wherein said one of the deferred executable instructions issued in the basic game comprises an override command executable by the processor in response to indicia displayed in the bonus game.

20. The gaming machine of claim 19 wherein said one of the deferred executable instructions issued in the basic game comprises an override command executable by the processor to override an end-bonus outcome displayed in the bonus game.

21. The gaming machine of claim 15 wherein one of said at least one deferred executable instructions is issued by the means for issuing in response to one of the basic game outcomes and is executable by the processor in the basic game.

22. The gaming machine of claim 21 wherein said one of the deferred executable instructions issued in the basic game comprises an override command executable by the processor in response to indicia later displayed in the basic game.

23. The gaming machine of claim 21 wherein said one of the deferred executable instructions issued in the basic game comprises an override command executable by the processor to override a symbol combination displayed in the basic game.

24. The gaming machine of claim 21 wherein the override command causes the processor to override a lower-paying symbol combination displayed in the basic game in favor of a higher-paying symbol combination.

25. The gaming machine of claim 15 wherein one of said at least one deferred executable instructions is issued by the means for issuing in response to one of the bonus game outcomes and is executable by the processor in the bonus game.

26. The gaming machine of claim 25 wherein said one of the deferred executable instructions issued in the bonus game comprises an override command executable by the processor in response to indicia later displayed in the bonus game.

27. A method of operating a gaming machine under control of a processor in a basic mode and a bonus mode, the method comprising the steps of:

selecting, under control of the processor, one or more basic game outcomes in the basic mode and one or more bonus game outcomes in the bonus mode;

issuing, under control of the processor, game control instructions associated with a plurality of the selected outcomes, the game control instructions including at least one deferred execution instruction issued in response to a selected basic game outcome;

executing, under control of the processor, the deferred execution instruction in response to a selected bonus game outcome.

28. The method of claim 27 wherein the at least one deferred execution instruction comprises an override command executable, under control of the processor, to override a nominal instruction associated with the selected bonus game outcome.

29. A gaming machine comprising:

a processor operable t execute a game program defining a plurality f stations about a game board traversable by a token identifier;

a game memory operably coupled to the processor, the game memory storing a plurality f movement tables each corresponding to one of the stations of the game board, each of the movement tables defining a set of possible movement outcomes;

means for identifying, under control of the processor, a position of the token identifier comprising any one of the stations on the game board; and

means for consulting, under control of the processor, one or more of the movement tables associated with the position of the token identifier to select a movement outcome.

30. The gaming machine of claim 29 wherein at least one station of the game board is associated with a first and second movement table stored in the game memory, the processor determining the movement outcome from said station by selecting a first outcome from the first movement table, a second outcome from the second movement table and then summing the first and second outcomes to determine said movement outcome.

31. The gaming machine of either claim 28 or 29 further comprising means for moving the token identifier a number of steps on the game board corresponding to the selected movement outcome.

32. The gaming machine of claim 29 wherein each of the movement tables define an equal number of possible movement outcomes.

33. The gaming machine of claim 29 wherein each of the movement tables assigns a predefined selection probability to each of the possible movement outcomes.

34. A method of operating a gaming machine under control of a processor, the processor being operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the method comprising:

storing a plurality of movement tables in a game memory, each of the movement tables defining a set of possible movement outcomes;

identifying, under control of the processor, a position of the token identifier comprising any one of the stations on the game board; and

consulting, under control of the processor, the movement table associated with the position of the token identifier to select a movement outcome.

35. A method of operating a gaming machine under control of a processor, the processor being operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the method comprising:

designating one of the stations as a bonus station;

executing, under processor control, the game program to advance the token identifier along the game board;

awarding a payoff to the player each successive time the token identifier reaches the bonus station, the payoff escalating each successive time the token identifier reaches the bonus station.

36. The method of claim 35 wherein the bonus station is predefined by the game program.

37. The method of claim 36 wherein the bonus station comprises a starting station of the token identifier upon execution of the game program.

38. The method of claim 35 wherein the processor is operable in a basic mode and a bonus mode, the executing step being accomplished in the bonus mode.

39. A gaming machine comprising:

a processor operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the game program designating one of the stations as a bonus station;

means for advancing, in response to execution of the game program, the token identifier along the game board;

a payoff mechanism for awarding a payoff to the player each successive time the token identifier reaches the bonus station, the payoff escalating each successive time the token identifier reaches the bonus station.

40. A method of operating a gaming machine under control of a processor, the processor being operable to execute a game program defining a plurality of stations about a game board traversable by a token identifier, the plurality of stations having at least one discernible subset defining a station group, the method comprising:

(a) executing, under processor control, the game program to determine one or more movements of the token identifier along the game board;

(b) identifying, after each of said one or more movements, a landing station defining the station occupied by the token identifier and, if the landing station is a member of a station group,

(1) assigning a completed station status to the landing station;

(2) evaluating the other stations in the station group associated with the landing station and, if each of the other stations has a completed station status, assigning a completed group status to the station group; and

(3) providing a reward to a player in response to any of the station groups having a completed group status.

41. The method of claim 40 wherein the station groups define color groups.

42. The method of claim 40 wherein, after providing a reward to the player in response to a completed group, the method comprises the steps of:

removing the completed group status of the station group; and

removing the completed station status of the stations in the station group.

43. The method of claims 40 wherein the step of executing the game program comprises determining a first number of movements of the token identifier along the game board and the step of providing a reward to the player comprises awarding the player a second number of additional movements of the token identifier along the game board.

44. The method of claim 43 wherein the step of providing a reward to the player comprises awarding the player a single additional movement of the token identifier along the game board.

45. The method of claim 40 wherein the landing station has a base value, the step of providing a reward to the player in response to a completed group comprising awarding the player an amount exceeding the base value.

46. The method of claim 40 wherein the step of providing a reward to the player in response to a completed group comprises awarding the player double the base value.

47. The method of claim 40 wherein the step of executing the game program to determine one or more movements of the token identifier along the game board comprises executing the game program a plurality of times.

48. The method of claim 40 wherein the step of executing the game program to determine one or more movements of the token identifier along the game board comprises executing the game program a plurality of times by a plurality of successive players.

49. A method of operating a gaming machine under control of a processor, the processor being operable in a basic mode to display a basic game outcome defining a symbol group, the method comprising:

(a) executing a first bonus game if the symbol group includes a first bonus combination, the step of executing the first bonus game comprising:

(1) setting up under control of the processor a first bonus game by defining a plurality of first bonus selection elements; and

(2) selecting one of the first bonus selection elements;

(3) determining under control of the processor a first bonus value associated with the selected one of the first bonus selection elements; and

(4) awarding a credit based on said first bonus value;

(b) executing a second bonus game if the symbol group includes a second bonus combination, the step of executing the second bonus game comprising:

(1) setting up under control of the processor a second bonus game by defining a plurality of stations about a game board traversable by a token identifier;

(2) executing a movement of the token identifier to determine a landing station;

(3) determining under control of the processor a second bonus value associated with the landing station; and

(4) awarding a credit based on said second bonus value.

50. The method of claim 49 wherein the step of setting up a first bonus game comprises defining a first plurality of selection elements having a fixed value and a second plurality of selection elements having a multiplier value.

51. The method of claim 49 wherein the first bonus combination comprises a basic winning combination including a first bonus wildcard symbol.

52. The method of claims 49 wherein the second bonus combination comprises a combination of start-bonus symbols displayed in scatter-pay format.

53. A processor controlled game of chance comprising:

a) a processor, operating according to a game program, for randomly selecting symbols and for awarding credits when winning symbol combinations are selected;

b) display means on which said selected symbol combinations are displayed to a game player;

c) said processor operating in a basic mode unless and until a bonus symbol combination is selected, said processor, in said basic mode, selecting symbols and awarding credits or money in response to the input of money or credits by said player;

d) said processor operating in a bonus mode after said bonus symbol combination is selected; said processor, in said bonus mode: (1) selecting an outcome as the result of a trial having a first probability of a winning outcome; (2) displaying the outcome on a display; (3) adding credits to a bonus mode total if said outcome is a winning outcome; (4) repeating steps d(1) to d(3) using the same or a different probability of a winning outcome, until a losing outcome occurs;

whereby a player who reaches the bonus mode accumulates credits as a function of the number of trials survived.

54. A processor controlled game of chance in accordance with Claim 53 wherein the probability of selecting a non-losing outcome is a variable probability and is greater than 50% for some trials.

55. A processor controlled game of chance in accordance with either Claim 53 or 54 wherein said bonus mode comprises a trail game; and wherein said step of selecting an outcome as the result of a trial comprises selecting a random movement value to reach a position on said trail and selecting an outcome from at least one alternative allowable outcomes associated with said position.

56. The processor controlled game of chance of Claim 53 wherein the display means includes at least two physical reels having symbols arranged thereon, the selected symbols being displayed to a player by rotation of said reels.

57. The processor controlled game of chance of Claim 53 wherein said processor is programmed to produce an expected value (EV) for said bonus mode greater than 1.0 but wherein the EV of the combined basic and bonus modes is less than 1.0.

58. A processor controlled game of chance in accordance with Claims 53 wherein the bonus game is ended if the number of trials exceeds a predetermined maximum.

59. A processor controlled game of chance in accordance with Claim 53 wherein the bonus game is ended if the accumulated winnings exceeds a predetermined maximum.

60. In a gaming machine including processor means for randomly selecting outcomes, some of which are winners and the remainder being losers; and for awarding credits or money corresponding to said winners, and display means for displaying the selected outcomes the improvement comprising:

a) said processor means being programmed to designate certain outcomes as a bonus event permitting the play of a bonus game;

b) said processor, during bonus game play, iteratively and randomly selecting outcomes, each of which is the result of a trial wherein the probability of success may vary between trials;

c) displaying said outcomes and awarding the credits associated therewith until a losing outcome is selected;

whereby a player who reaches the bonus game accumulates credits as a function of the number of variable probability trials survived.

61. A processor controlled game of chance comprising:

a) a processor, operating according to a game program, for randomly selecting symbols and for awarding credits when winning symbol combinations are selected;

b) display means on which said selected symbol combinations are displayed to a game player;

c) said processor operating in a basic mode unless and until a bonus symbol combination is selected, said processor, in said basic mode, selecting symbols and awarding credits or money in response to the input of money or credits by said player;

d) said processor operating in a bonus mode after said bonus symbol combination is selected; said processor, in said bonus mode: (1) selecting an outcome as the result of a variable probability trial; (2) displaying the outcome on a display; (3) adding an award to a bonus game award total if said outcome is an award paying outcome; (4) repeating steps d1 to d3 until a losing outcome occurs; (5) paying out said bonus game award total;

whereby a player who reaches the bonus mode accumulates credits as a function of the number of variable probability trials survived.

62. A processor controlled game of chance in accordance with Claim 61 wherein the bonus game is ended if the number of trials exceeds a predetermined maximum.

63. A processor controlled game of chance in accordance with Claim 61 or 62 wherein the bonus game is ended if the accumulated winnings exceeds a predetermined maximum.

64. A processor controlled game of chance in accordance with Claim 61 wherein the probability of selecting a non-losing outcome as the result of a variable probability variable probability trial is less than 50% for some outcomes.

65. A gaming machine comprising,:

a) processor means for randomly selecting outcomes, some of which are winners and the remainder being losers; and for awarding credits or money corresponding to said winners,

b) display means for displaying the selected outcomes

the improvement comprising:

i) said processor means being programmed to designate certain outcomes as a bonus outcome permitting the play of a bonus game; and

ii) said processor, during bonus game play, iteratively and randomly selecting outcomes as a sequence of variable probability trials, displaying said outcomes and awarding the credits associated therewith until a losing outcome is selected;

whereby a player who reaches the bonus game accumulates credits as a function of the number of variable probability trials survived.

66. A method of operating a gaming machine having a processor for randomly selecting game outcomes and for awarding credits or money for winning outcomes and, a display for displaying said outcomes to a game player comprising the steps of:

a) operating said processor in a basic mode unless and until an outcome, designated as a bonus outcome, is selected, said basic mode permitting outcome selection, display and credit awards only in response to the input of a credit by said player;

b) operating said processor in a bonus mode after said bonus outcome is selected, said bonus mode operation causing:

(1) random selection and display of outcomes as a sequence of variable probability trials which continue until a losing trial occurs;

(2) the award of credits or money for winning outcomes for each trial;

whereby a player who reaches the bonus mode accumulates credits as a function of the number of variable probability trials survived.

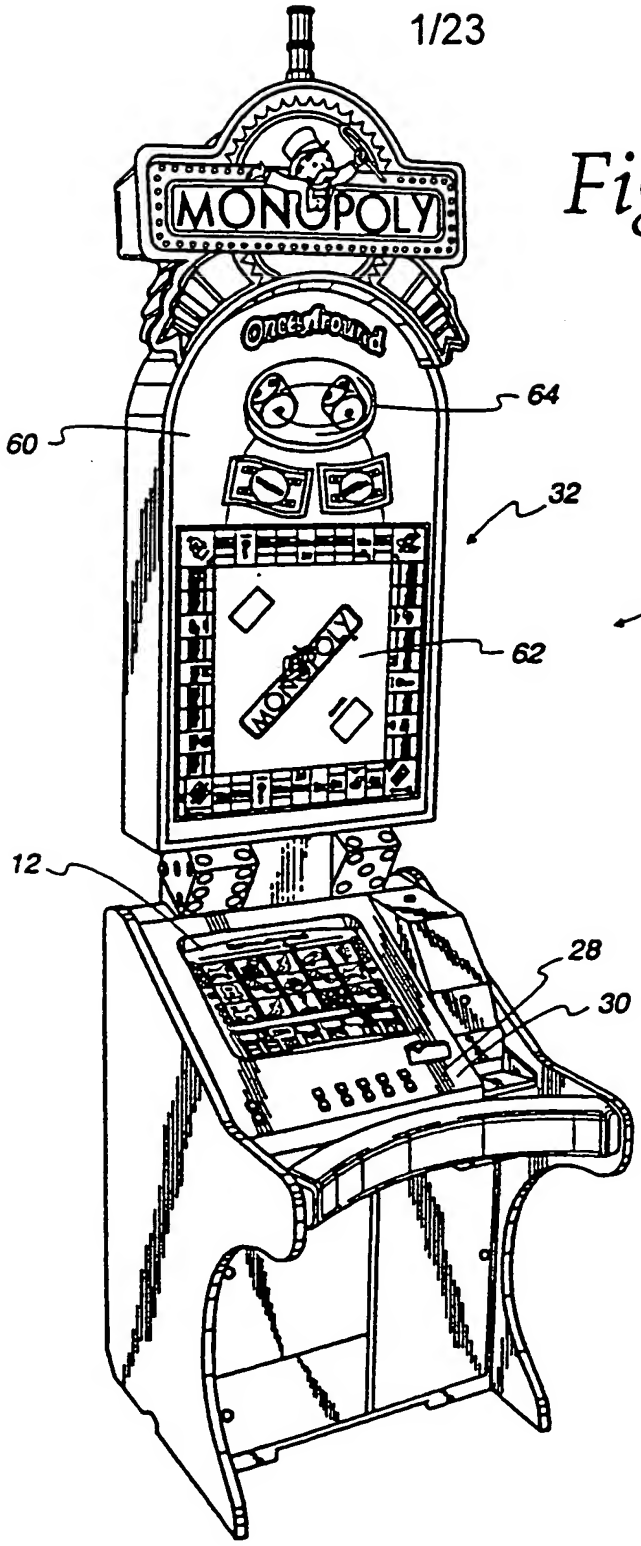


Fig. 1

Fig. 2

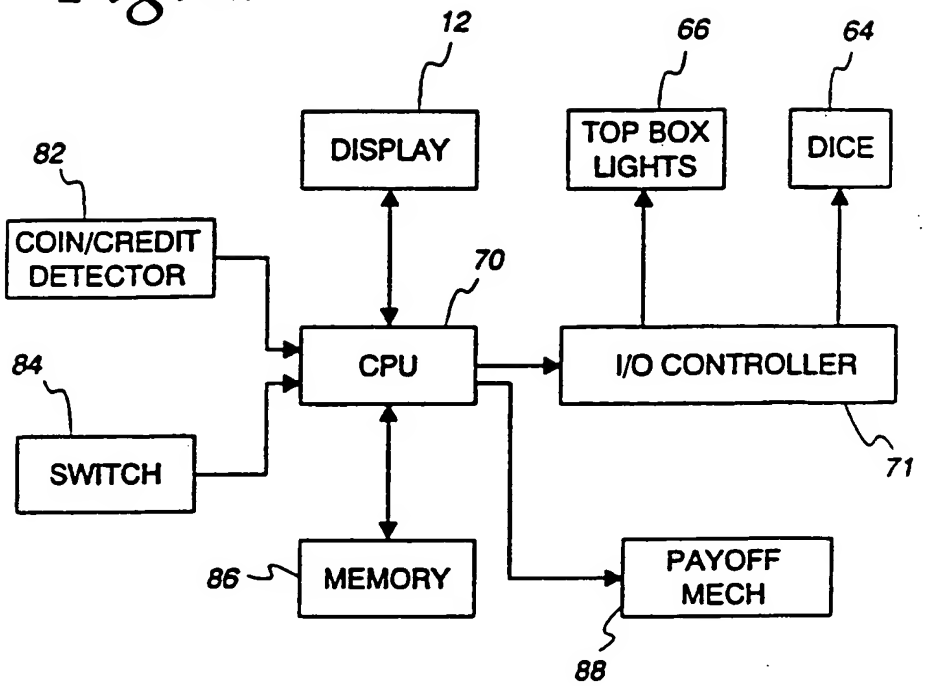

12
66
64
DISPLAY
TOP BOX LIGHTS
DICE
82
COIN/CREDIT DETECTOR
70
CPU
I/O CONTROLLER
84
SWITCH
71
86
MEMORY
PAYOFF MECH
88

Fig. 3

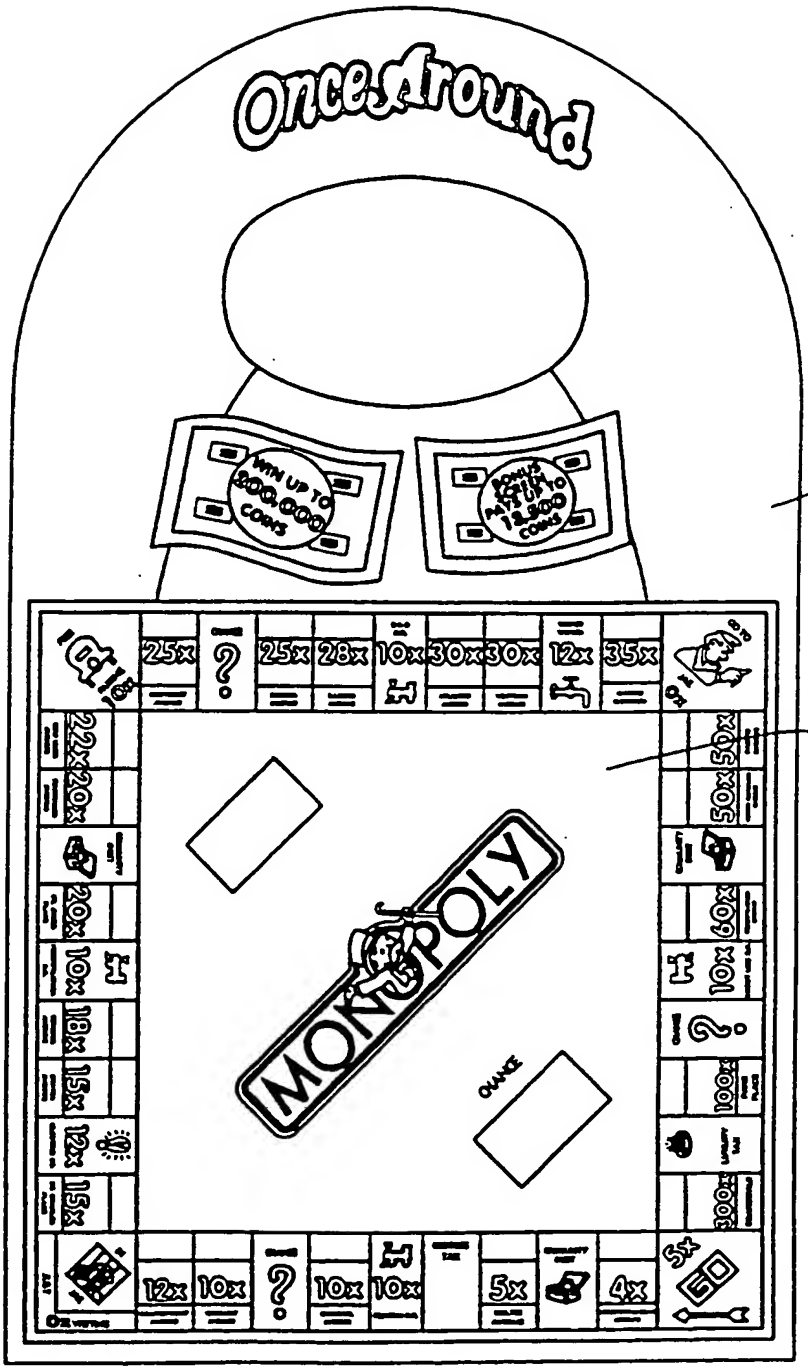


Fig. 4

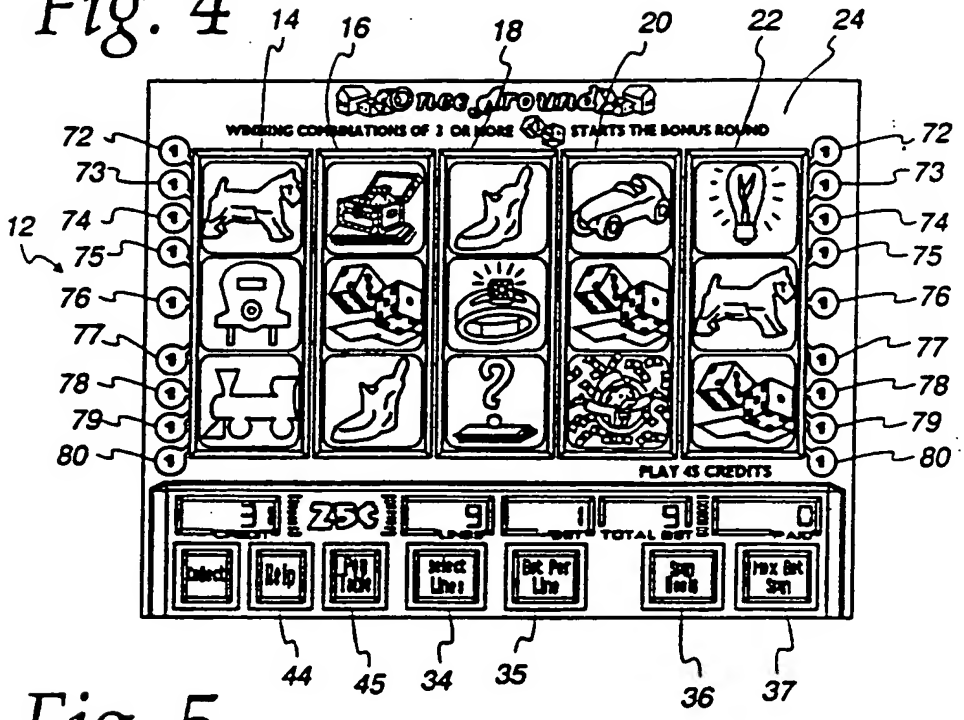

14
16
18
20
22
24
WINNING COMBINATIONS OF 3 OR MORE
STARTS THE BONUS ROUND
72
73
74
75
76
77
78
79
80
12
PLAY 45 CREDITS
44
45
34
35
36
37

Fig. 5

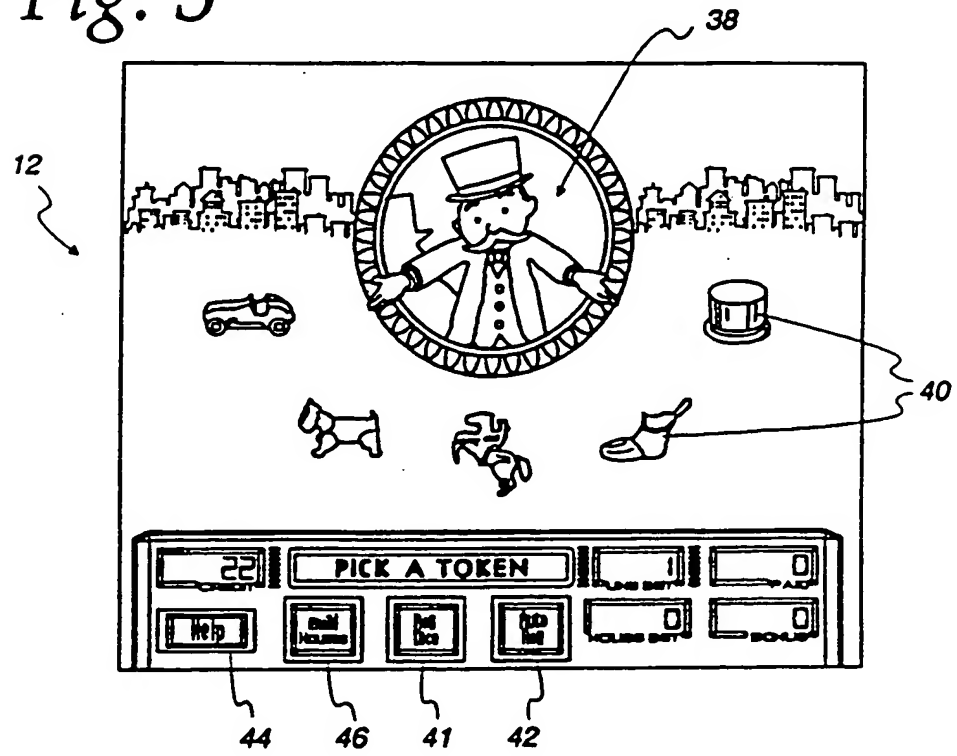

38
12
40
PICK A TOKEN
44
46
41
42

Fig. 6

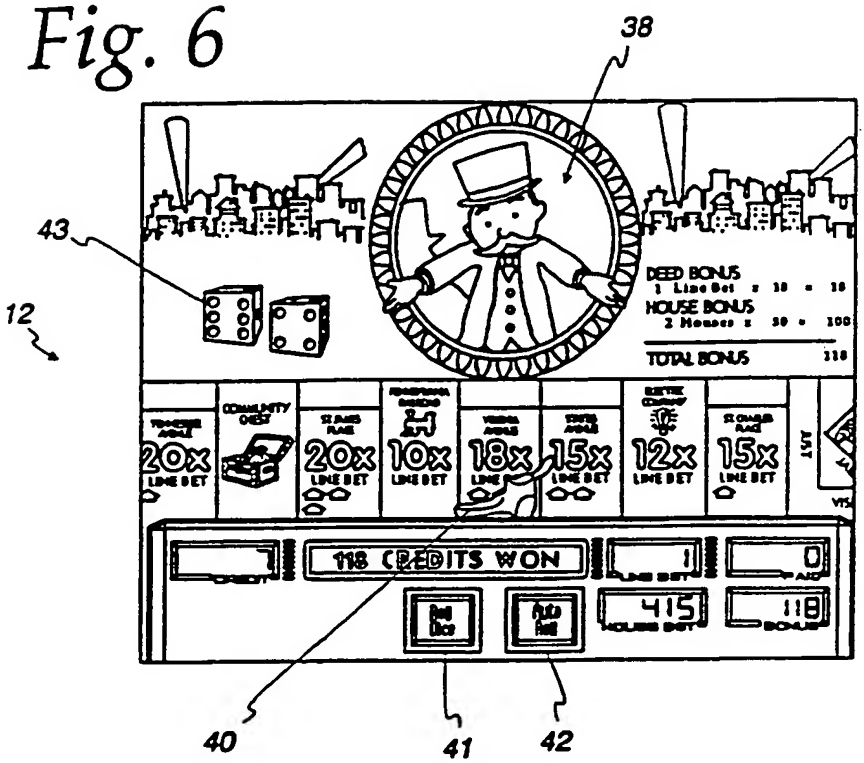

38
43
12
DEED BONUS
HOUSE BONUS
TOTAL BONUS
20x
20x
10x
18x
15x
12x
15x
118 CREDITS WON
40
41
42

Fig. 7

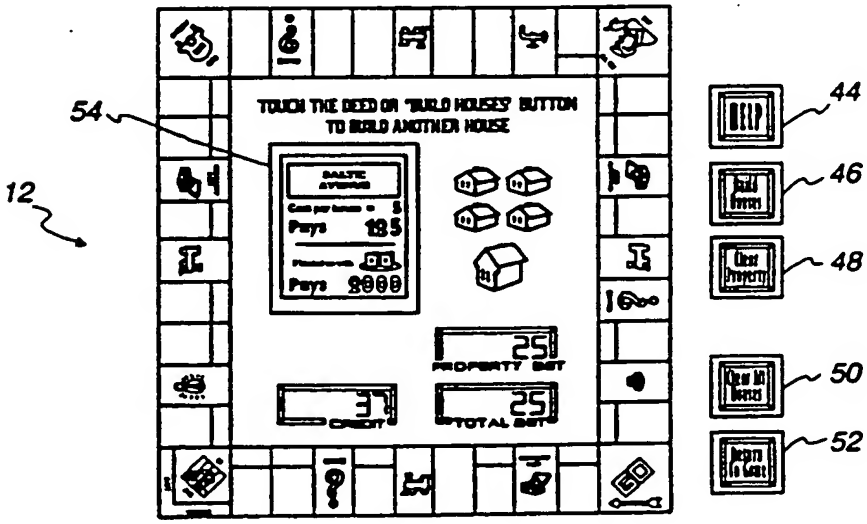

54
12
TOUCH THE DEED OR "BUILD HOUSES" BUTTON
TO BUILD ANOTHER HOUSE
Pays 185
Pays 2000
25
PROPERTY BET
31
CREDIT
25
TOTAL BET
44
46
48
50
52

Fig. 8

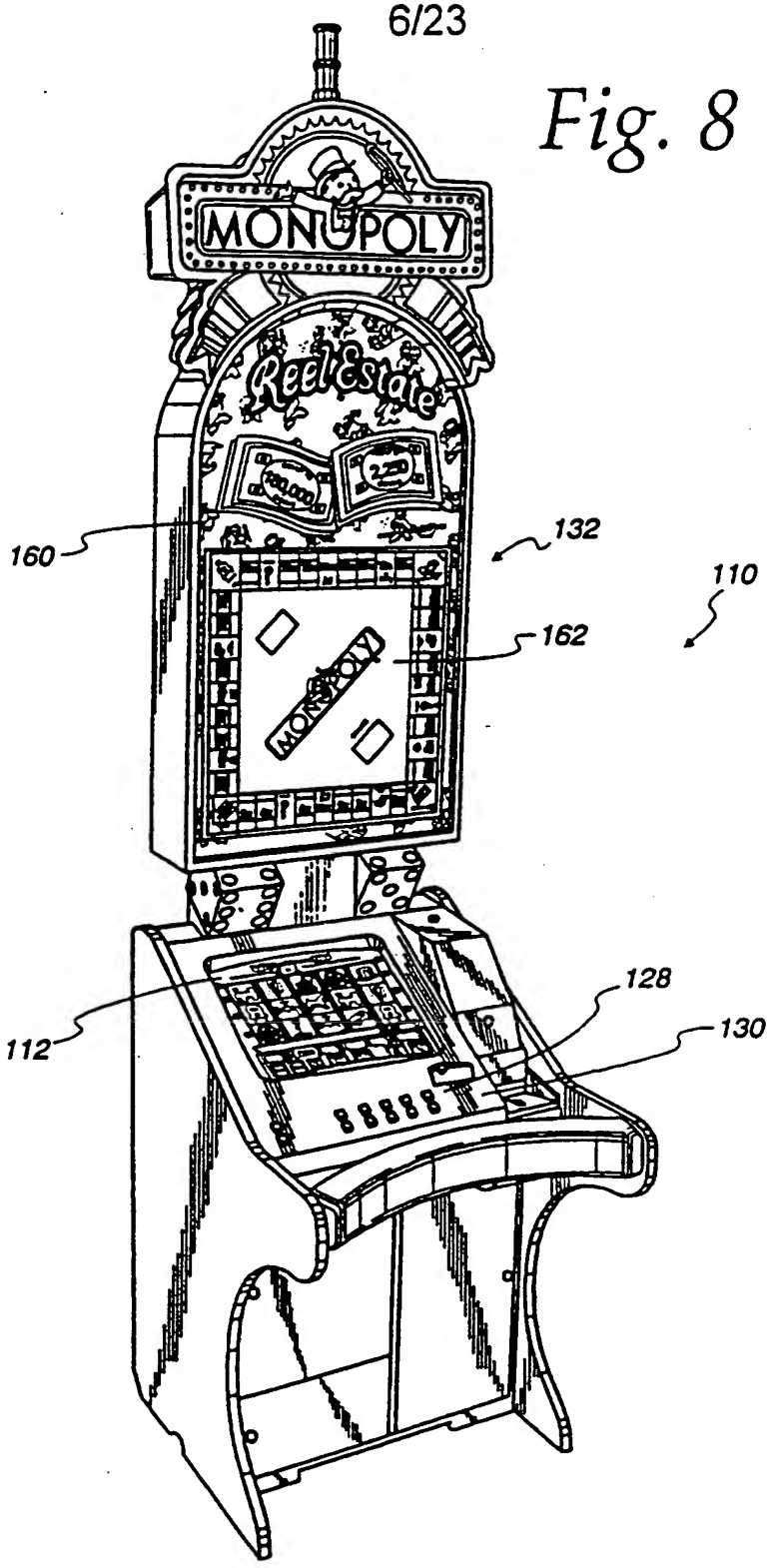


Fig. 9

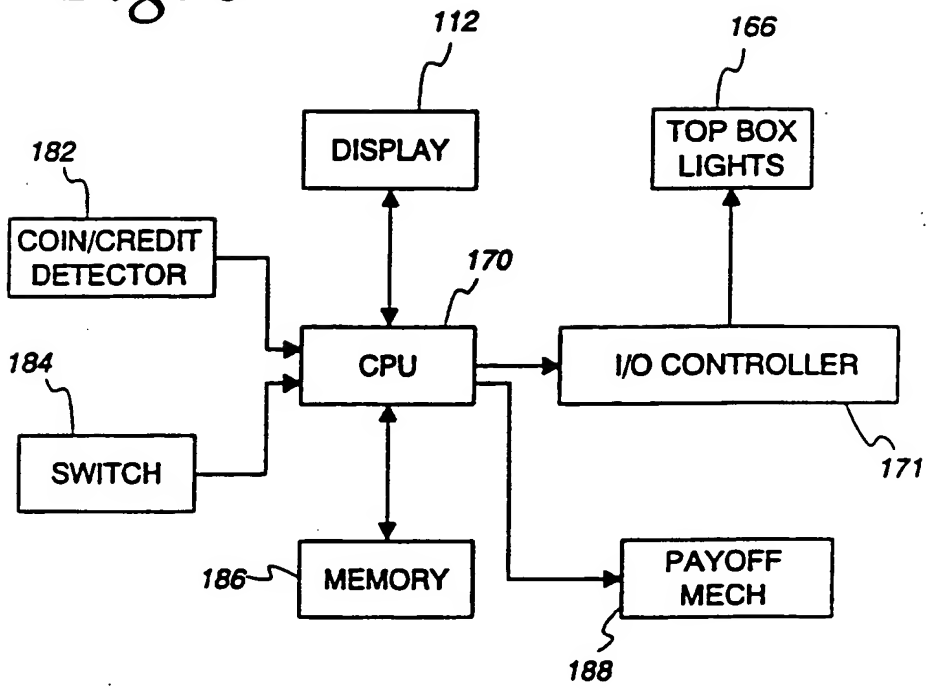

112
166
DISPLAY
TOP BOX LIGHTS
182
COIN/CREDIT DETECTOR
170
CPU
I/O CONTROLLER
184
SWITCH
171
186
MEMORY
PAYOFF MECH
188

Fig. 10

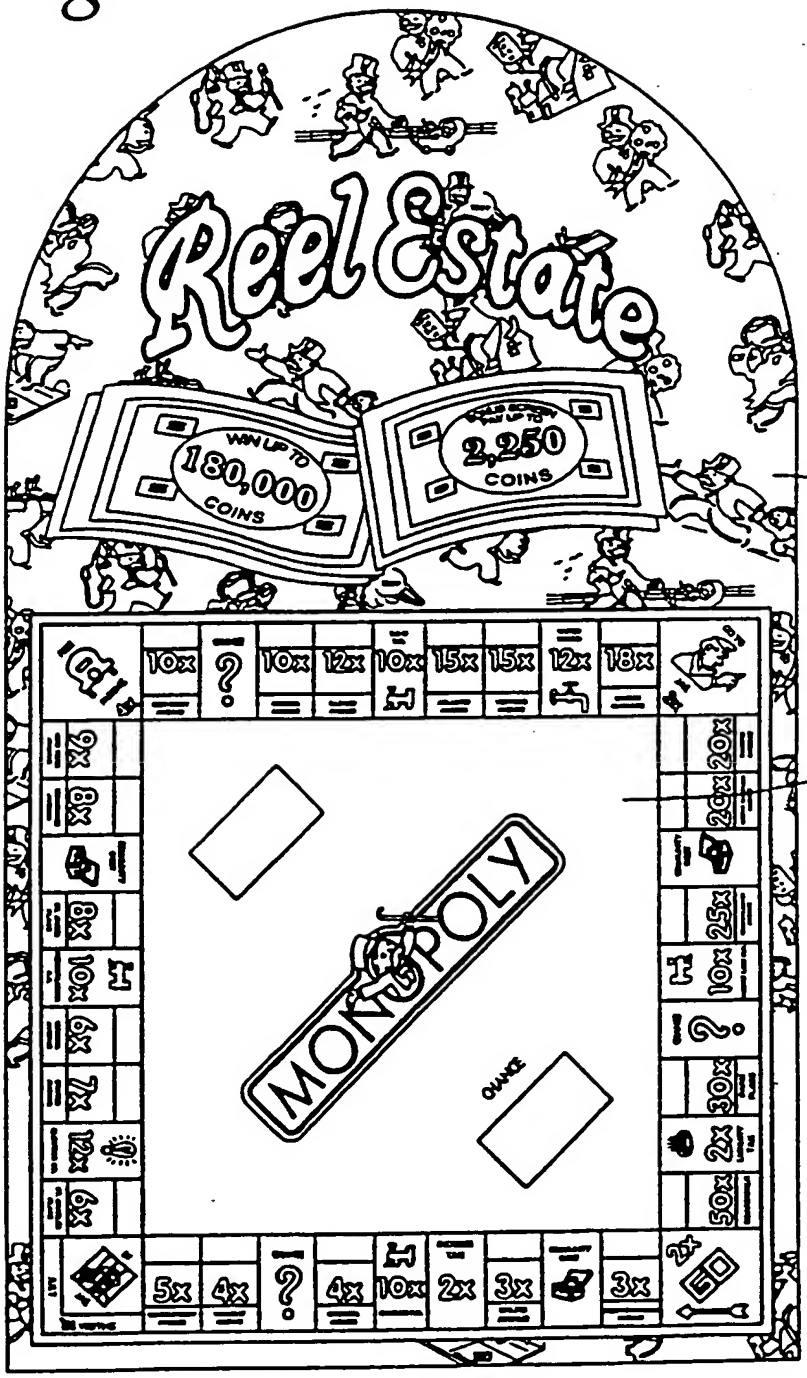

Reel Estate
WIN UP TO
180,000
COINS
2,250
COINS
MONOPOLY
CHANCE
160
162

Fig. 11

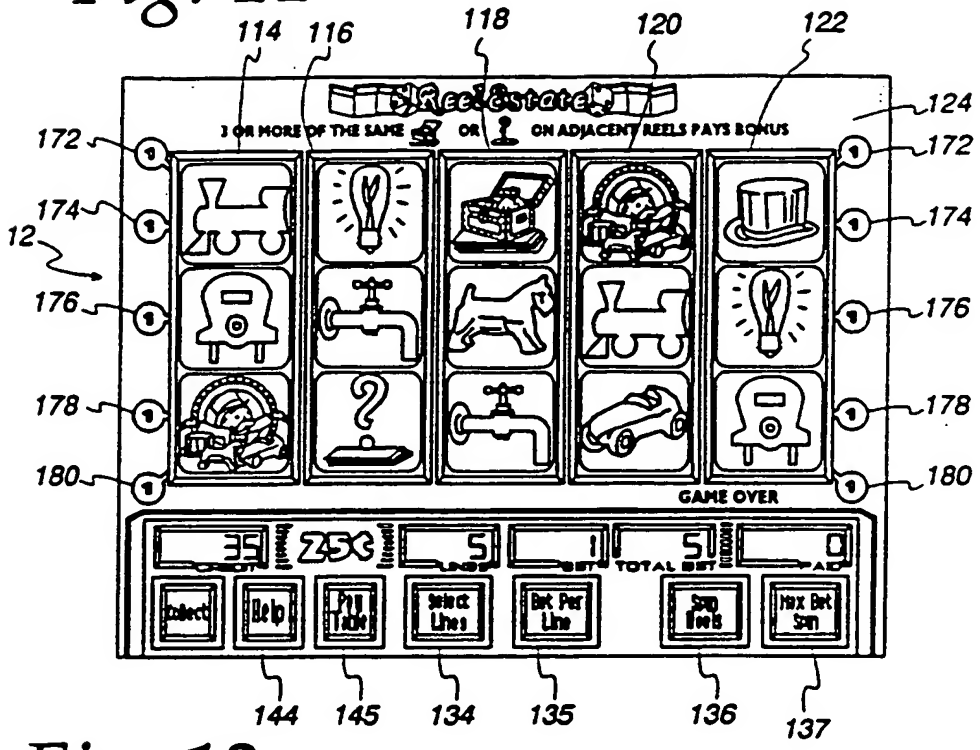

114
116
118
120
122
124
172
174
12
176
178
180
3 OR MORE OF THE SAME
OR
ON ADJACENT REELS PAYS BONUS
GAME OVER
144
145
134
135
136
137

Fig. 12

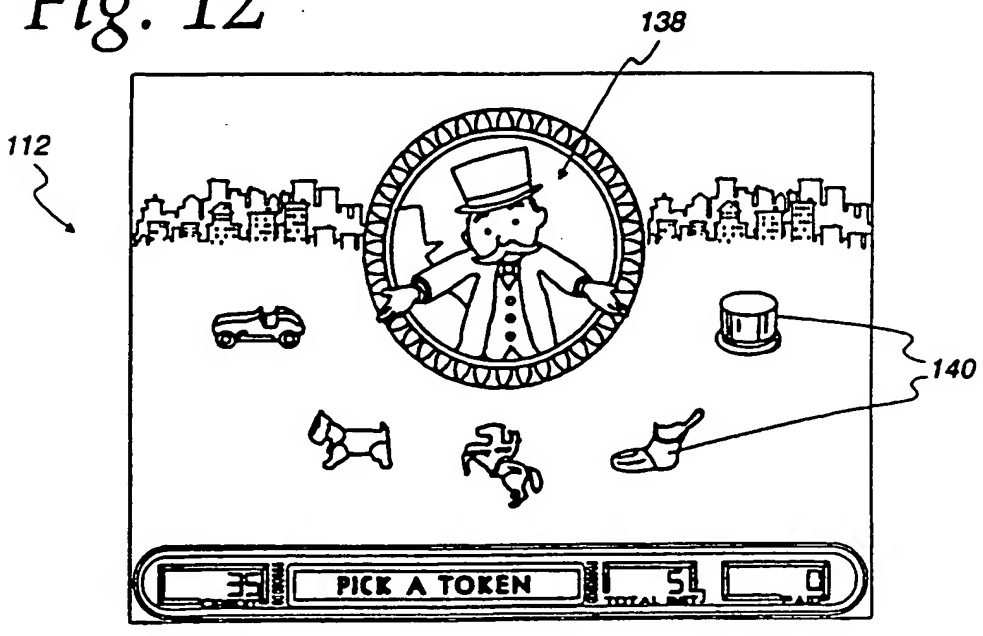

138
112
140
PICK A TOKEN

Fig. 13

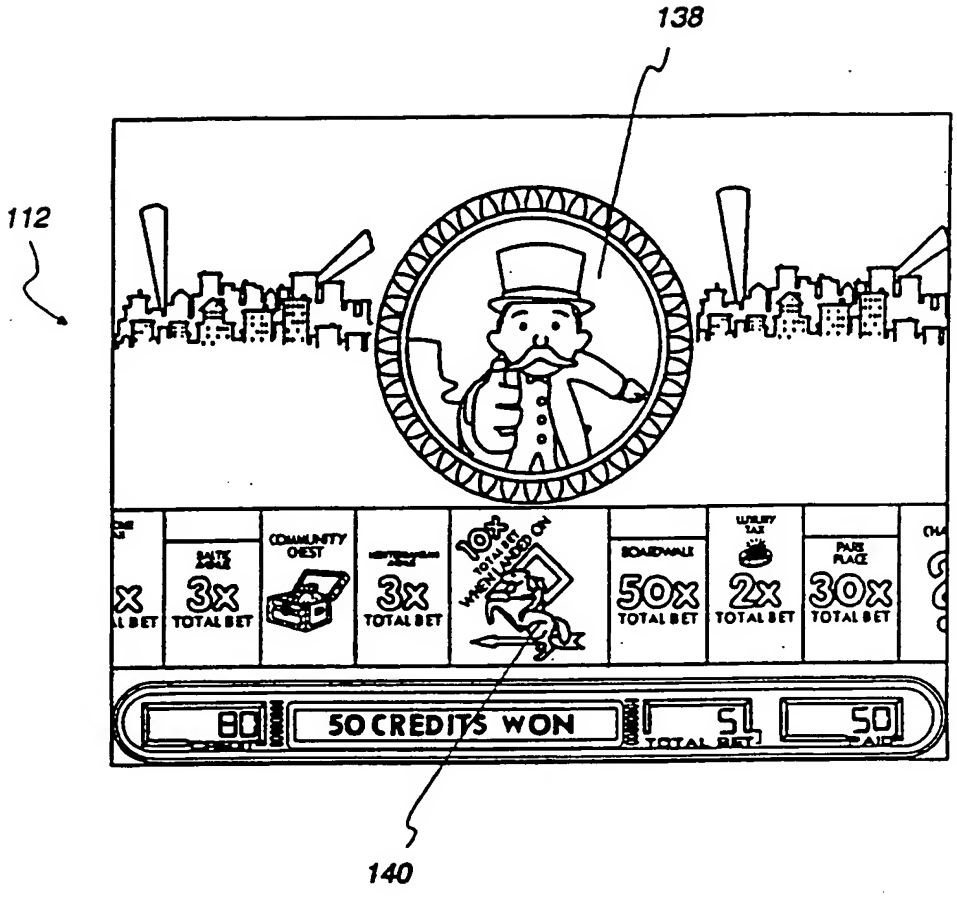

138
112
3X TOTAL BET
COMMUNITY CHEST
3X TOTAL BET
50X TOTAL BET
2X TOTAL BET
30X TOTAL BET
80
50 CREDITS WON
51
TOTAL BET
50
PAID
140

Fig. 14

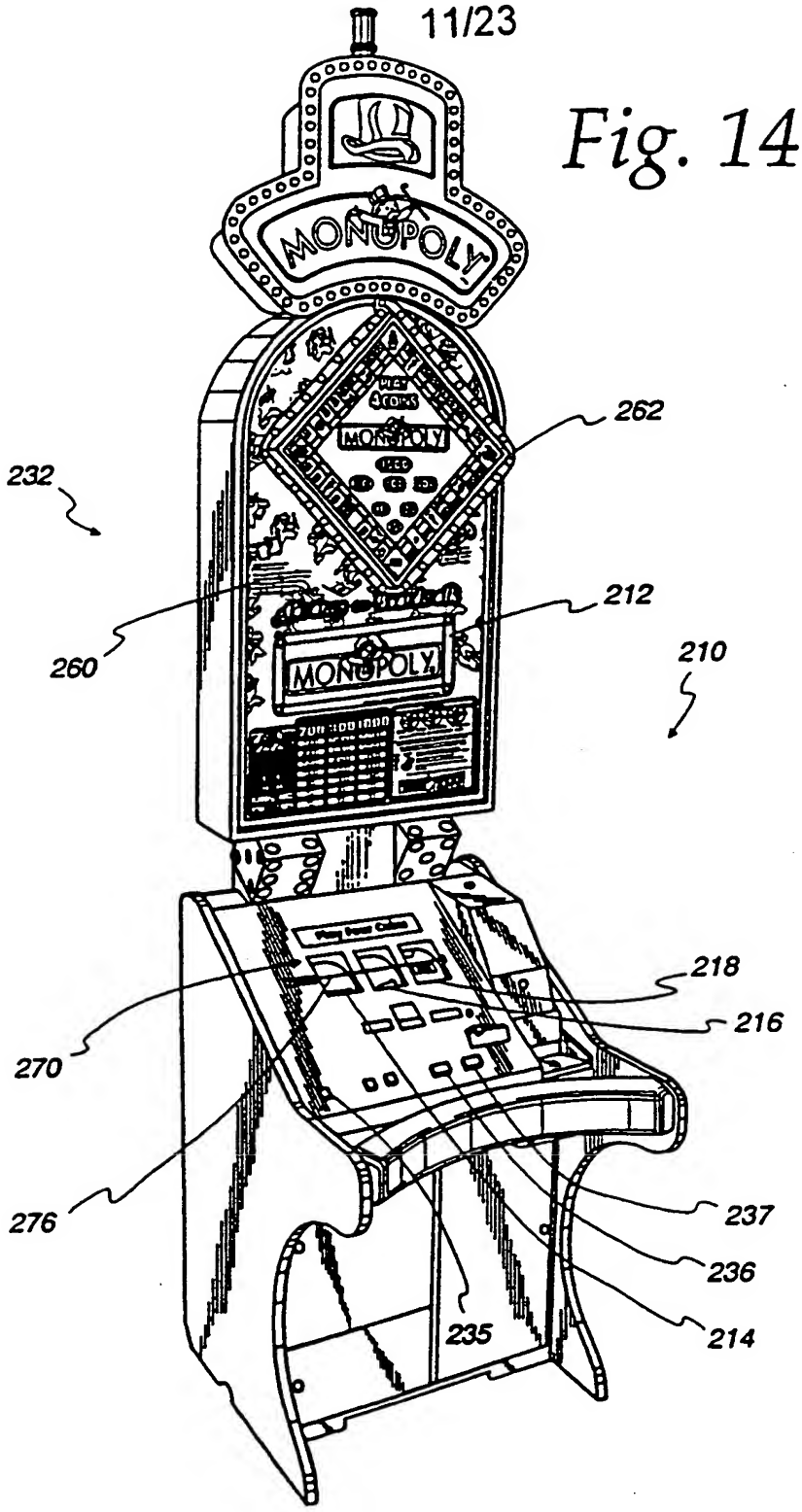

MONOPOLY
MONOPOLY
MONOPOLY
232
262
212
260
210
218
216
270
276
237
236
214
235

Fig. 15

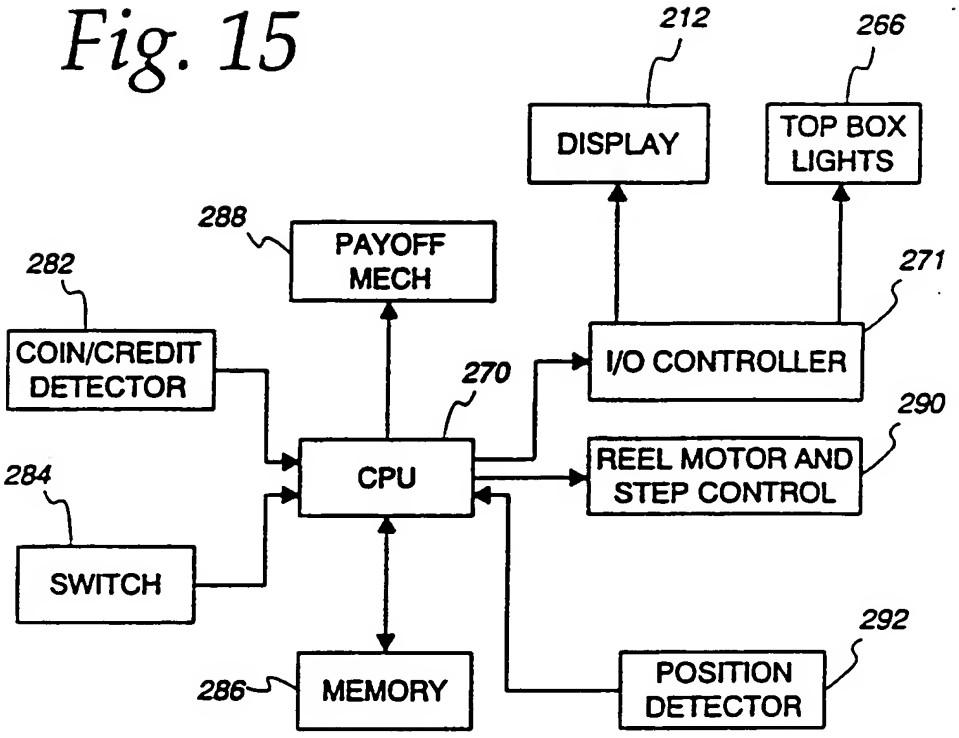

212
266
DISPLAY
TOP BOX LIGHTS
288
PAYOFF MECH
282
271
COIN/CREDIT DETECTOR
270
I/O CONTROLLER
290
CPU
REEL MOTOR AND STEP CONTROL
284
SWITCH
292
286
MEMORY
POSITION DETECTOR

Fig. 16a

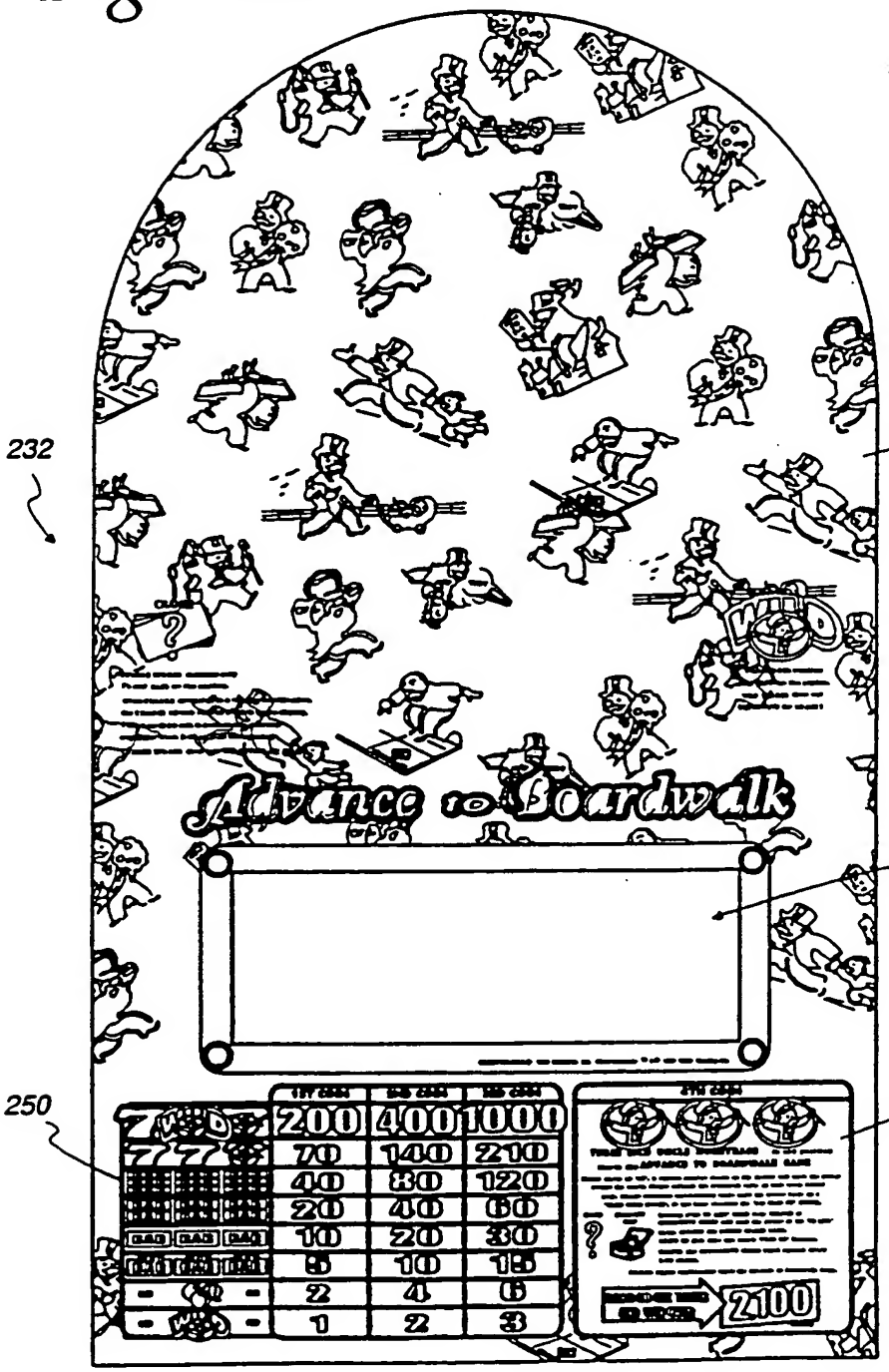

232
260
Advance to Boardwalk
212
250
252
200 400 1000
70 140 210
40 80 120
20 40 60
10 20 30
5 10 15
2 4 6
1 2 3
2100

Fig. 16b

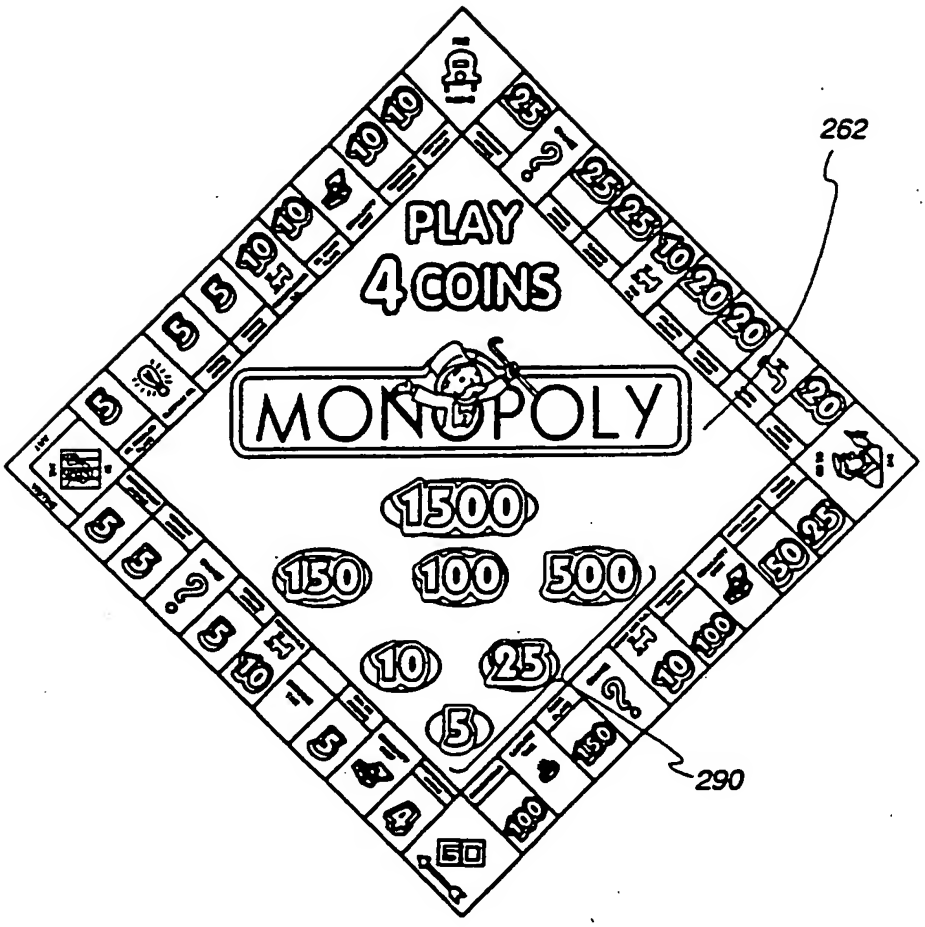


Fig. 17

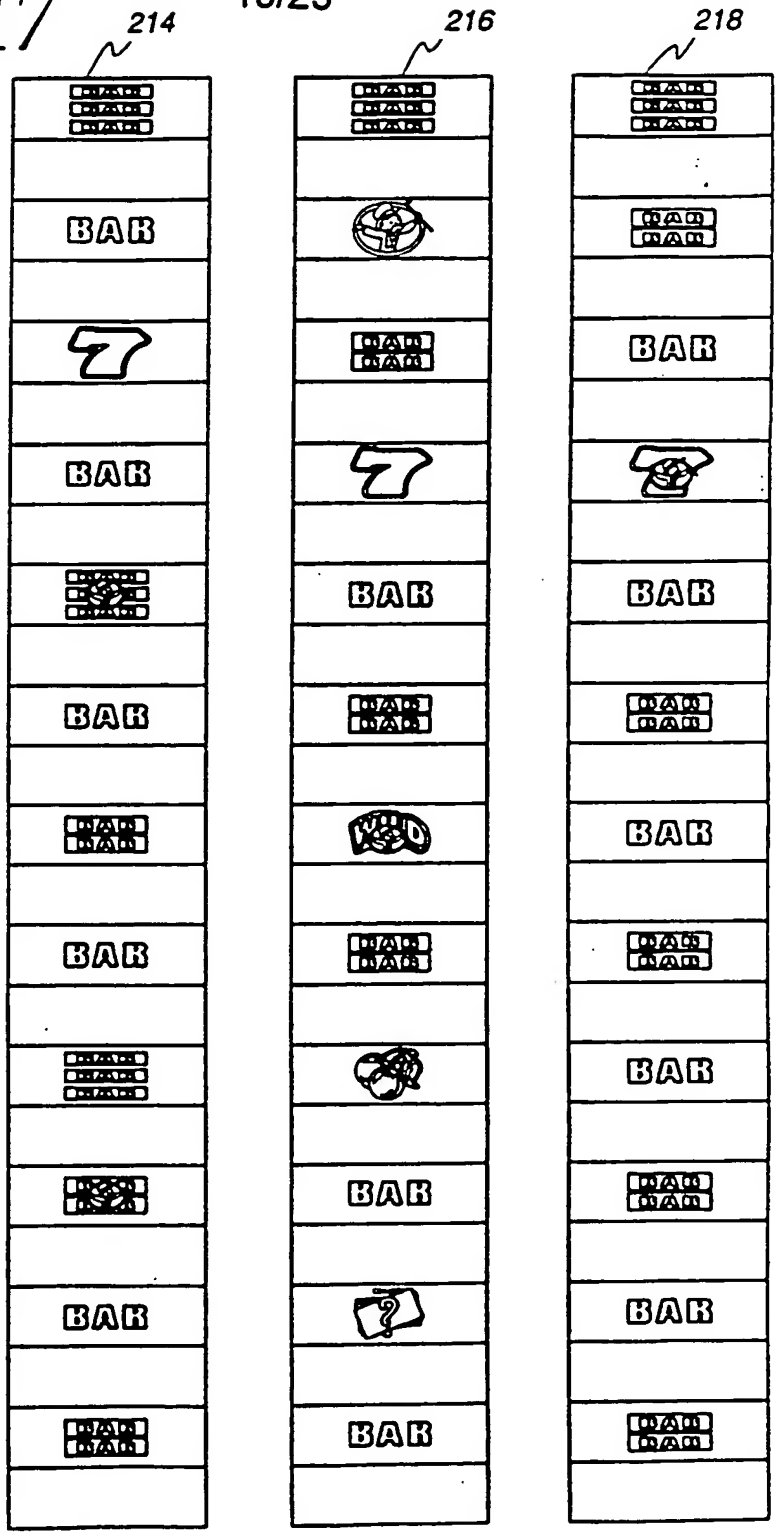


Fig. 18

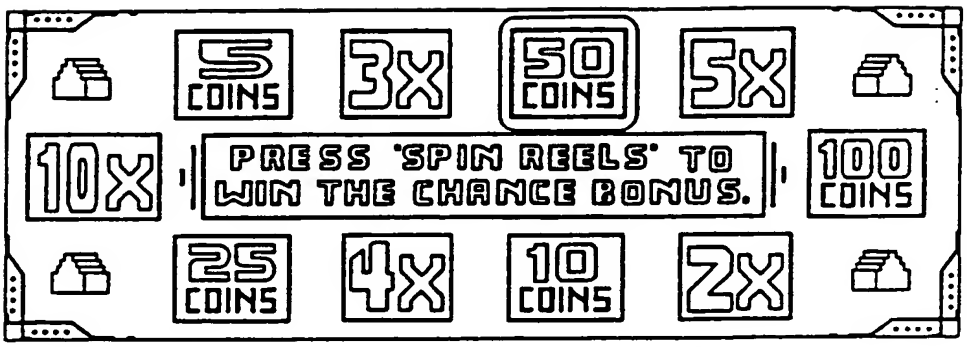

5 COINS
3X
50 COINS
5X
10X
PRESS 'SPIN REELS' TO WIN THE CHANCE BONUS.
100 COINS
25 COINS
4X
10 COINS
2X

Fig. 19

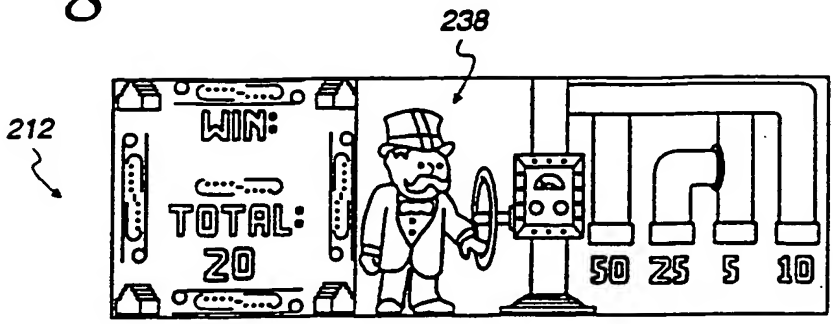


Fig. 20

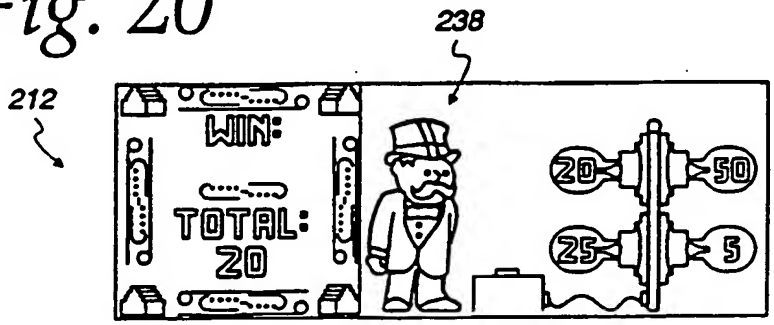


Fig. 21

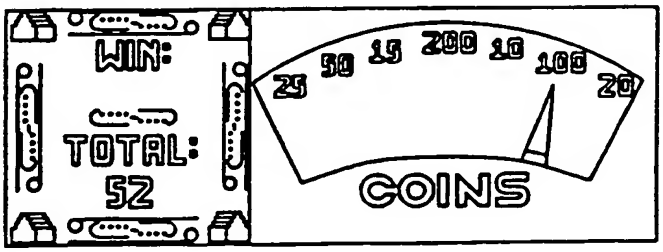


Fig. 22

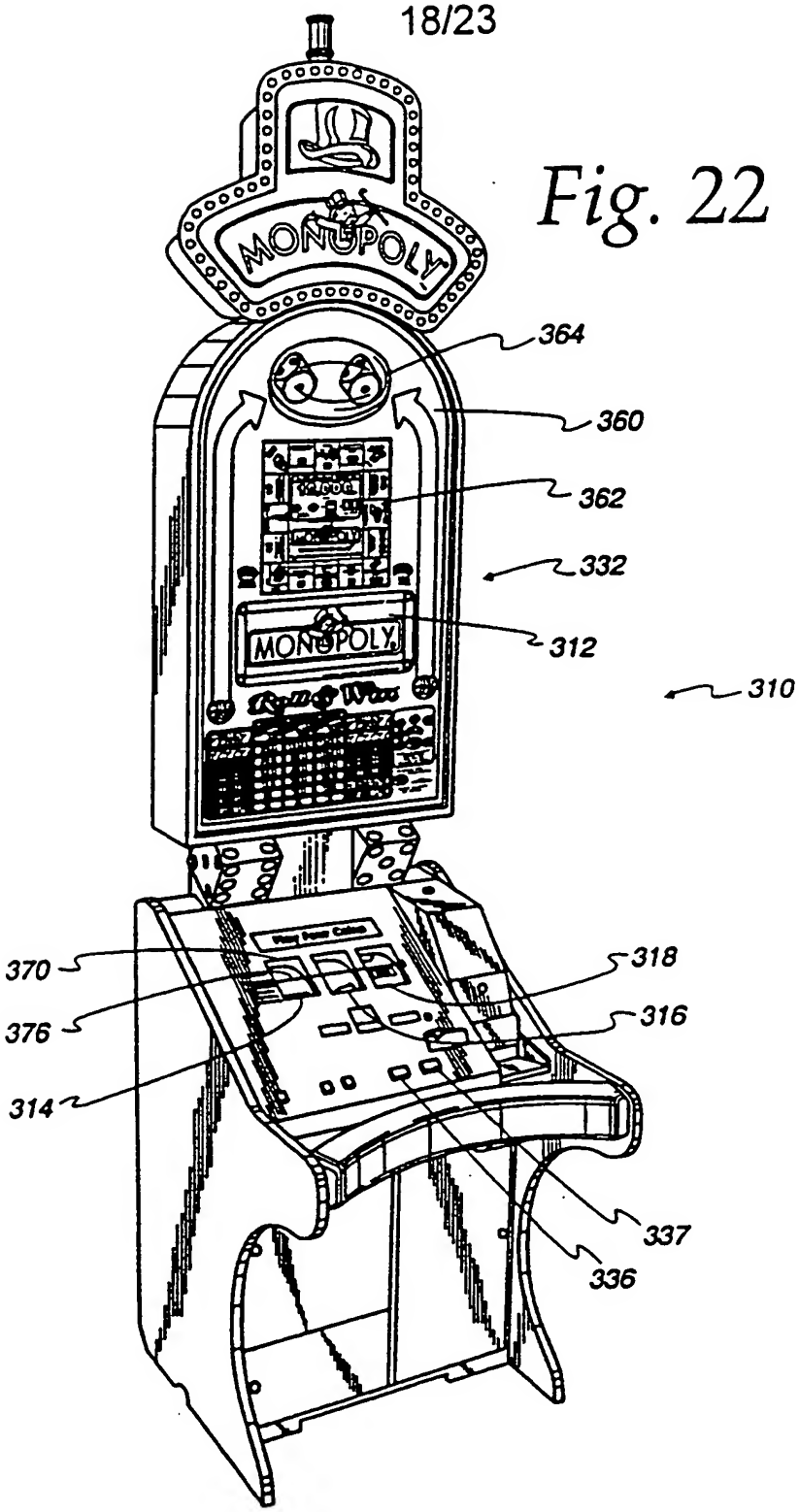

MONOPOLY
364
360
362
332
MONOPOLY
312
310
370
376
314
318
316
337
336

Fig. 23

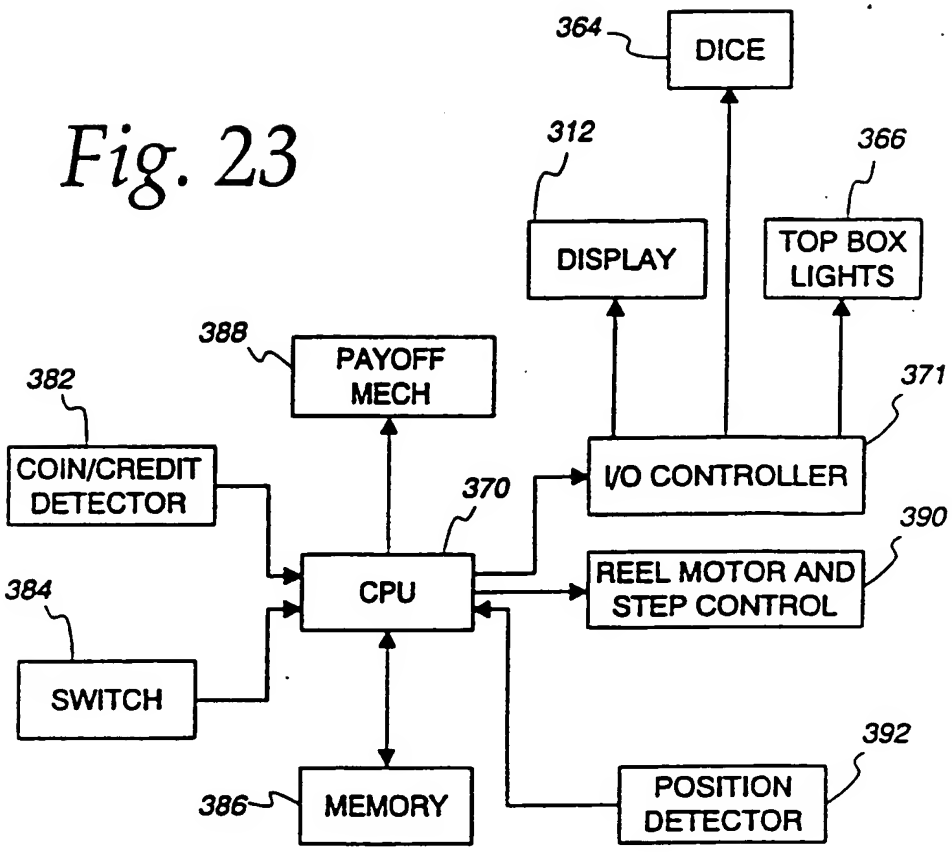

364
DICE
312
366
DISPLAY
TOP BOX LIGHTS
388
PAYOFF MECH
382
371
COIN/CREDIT DETECTOR
370
I/O CONTROLLER
390
384
CPU
REEL MOTOR AND STEP CONTROL
SWITCH
392
386
MEMORY
POSITION DETECTOR

Fig. 24

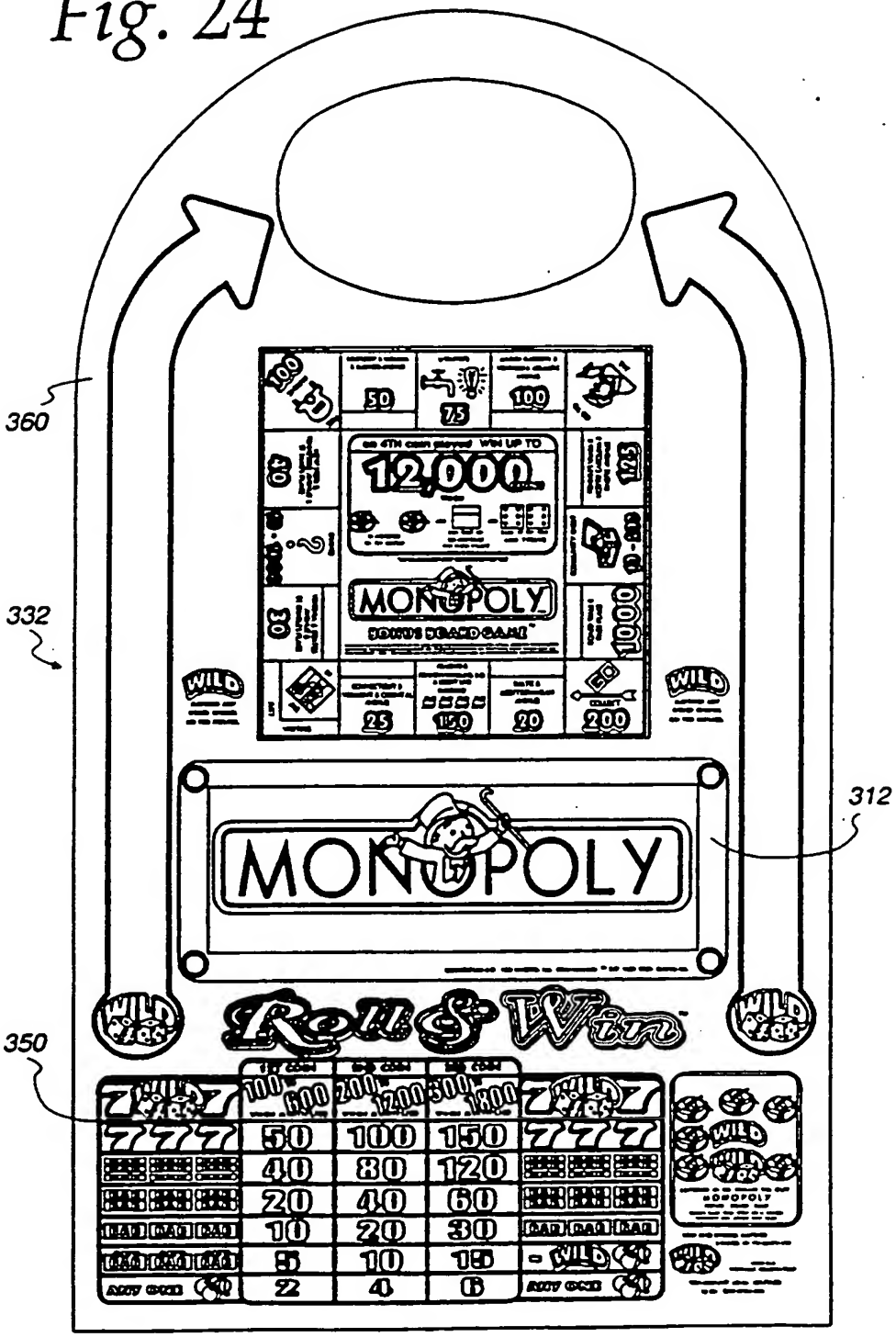

360
332
312
350
MONOPOLY
Roll & Win
WILD
50
75
100
12,000
40
125
80
1000
60
25
150
20
200
MONOPOLY
100
600
200
1200
300
1800
7777
50
100
150
40
80
120
20
40
60
10
20
30
5
10
15
2
4
6

Fig. 25

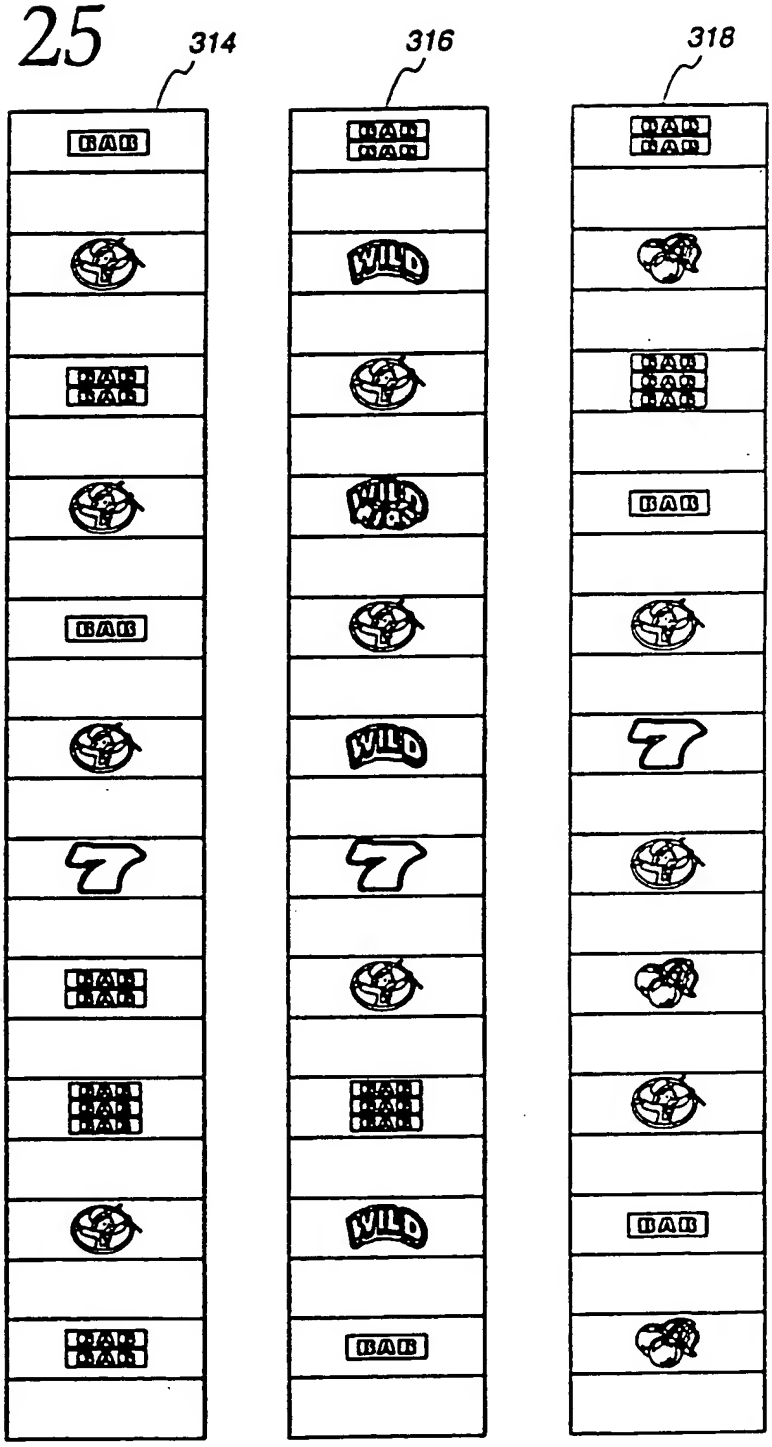
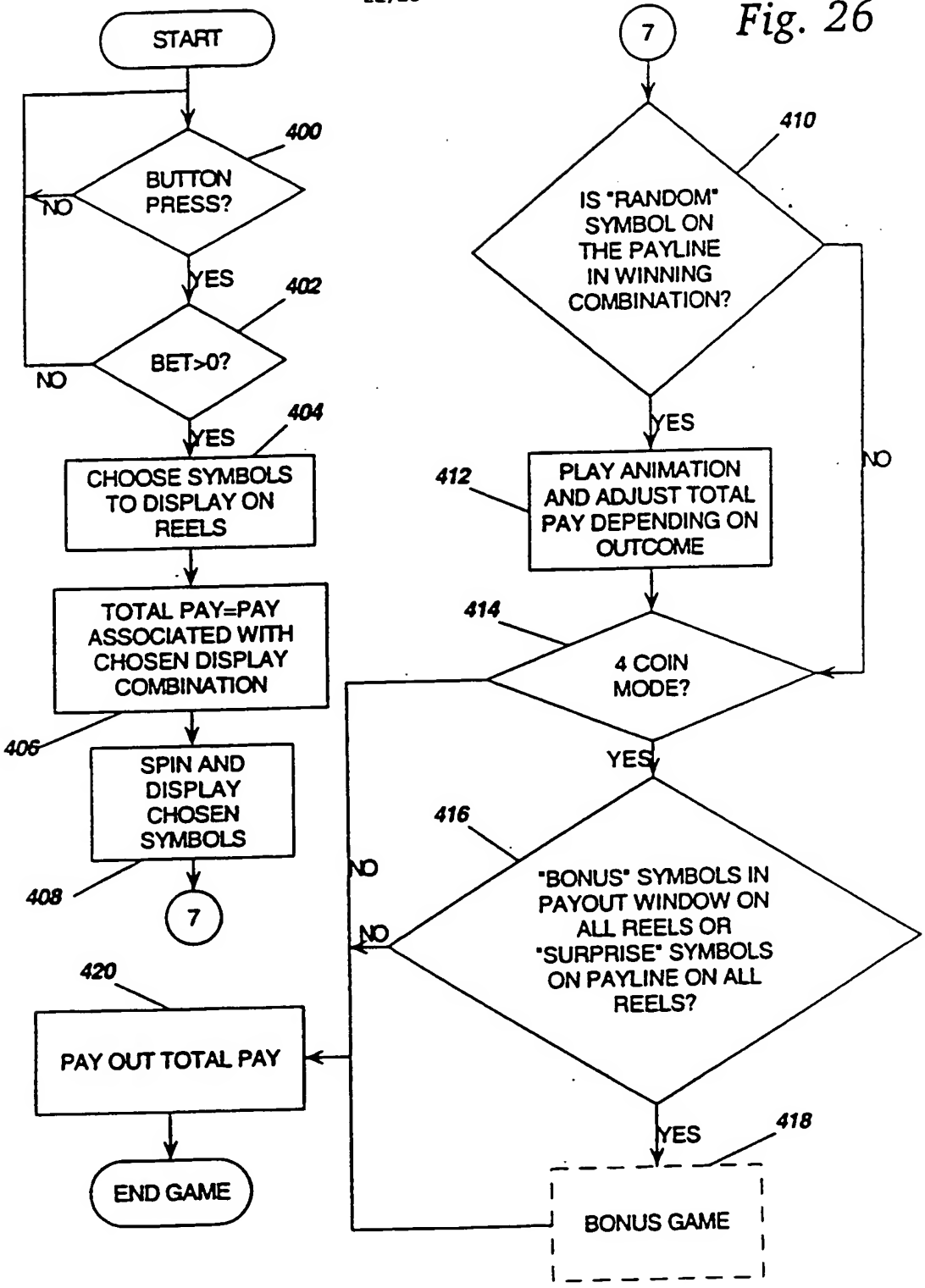
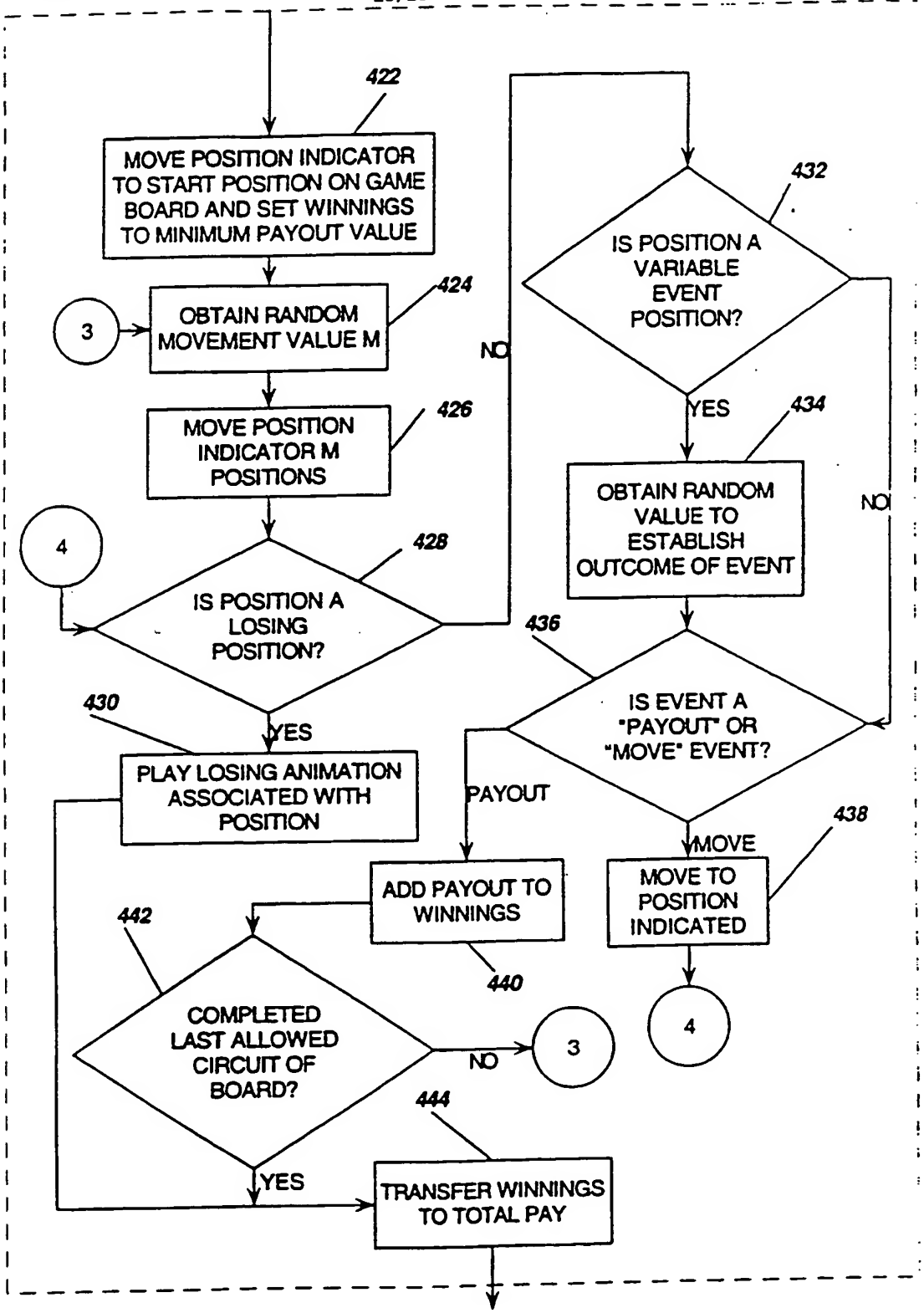


Fig. 26


START
400
BUTTON PRESS?
NO
YES
402
BET>0?
NO
YES
404
CHOOSE SYMBOLS TO DISPLAY ON REELS
TOTAL PAY=PAY ASSOCIATED WITH CHOSEN DISPLAY COMBINATION
406
SPIN AND DISPLAY CHOSEN SYMBOLS
408
7
7
410
IS "RANDOM" SYMBOL ON THE PAYLINE IN WINNING COMBINATION?
YES
NO
412
PLAY ANIMATION AND ADJUST TOTAL PAY DEPENDING ON OUTCOME
414
4 COIN MODE?
YES
NO
416
"BONUS" SYMBOLS IN PAYOUT WINDOW ON ALL REELS OR "SURPRISE" SYMBOLS ON PAYLINE ON ALL REELS?
NO
YES
418
BONUS GAME
420
PAY OUT TOTAL PAY
END GAME


422
MOVE POSITION INDICATOR TO START POSITION ON GAME BOARD AND SET WINNINGS TO MINIMUM PAYOUT VALUE
3
424
OBTAIN RANDOM MOVEMENT VALUE M
426
MOVE POSITION INDICATOR M POSITIONS
4
428
IS POSITION A LOSING POSITION?
NO
YES
430
PLAY LOSING ANIMATION ASSOCIATED WITH POSITION
432
IS POSITION A VARIABLE EVENT POSITION?
YES
434
OBTAIN RANDOM VALUE TO ESTABLISH OUTCOME OF EVENT
NO
436
IS EVENT A "PAYOUT" OR "MOVE" EVENT?
PAYOUT
MOVE
438
MOVE TO POSITION INDICATED
4
ADD PAYOUT TO WINNINGS
440
442
COMPLETED LAST ALLOWED CIRCUIT OF BOARD?
NO
3
YES
444
TRANSFER WINNINGS TO TOTAL PAY

INTERNATIONAL SEARCH REPORT

Inter. nal Application No
PCT/US 99/19830

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63F13/00 G07F17/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63F G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 35491 A (BRANDENBERG BRYAN ;YOUNG MONTE BERTRAM (US); MAST DAVID K (US)) 14 November 1996 (1996-11-14)	1,2,5
A	page 11, line 20 -page 13, line 7; figure 1	3,4,6-66
A	US 5 749 580 A (LOPEZ GILBERTO) 12 May 1998 (1998-05-12) column 1, line 47 -column 1, line 49; figure 1	1-66

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 December 1999	27/12/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Feber, L

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter. nal Application No
PCT/US 99/19830

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9635491 A	14-11-1996	AU 5860996 A	29-11-1996
US 5749580 A	12-05-1998	NONE	